July 11, 1933. N. W. WEBB 1,917,624

MACHINE FOR WORKING WIRE CLOTH

Filed Aug. 29, 1930

Fig. 1.

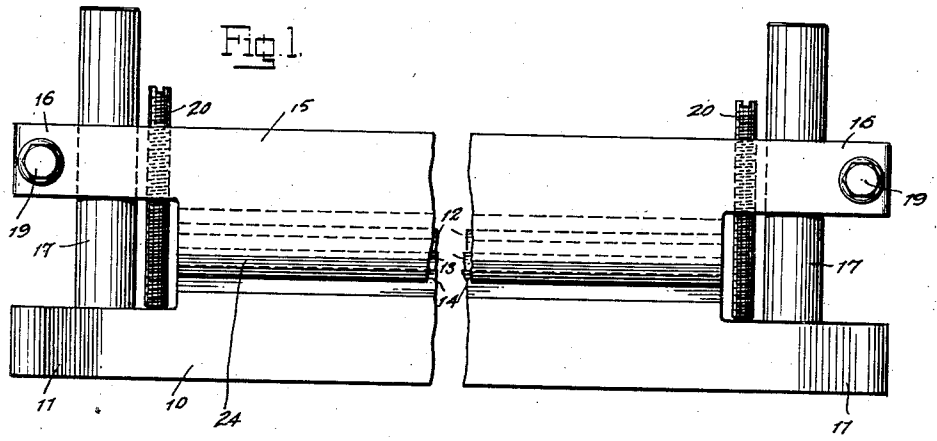



Fig. 2.

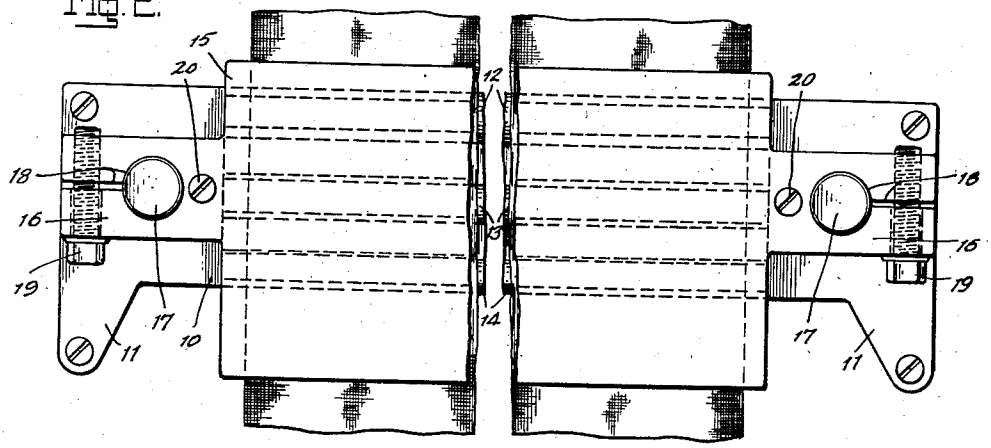
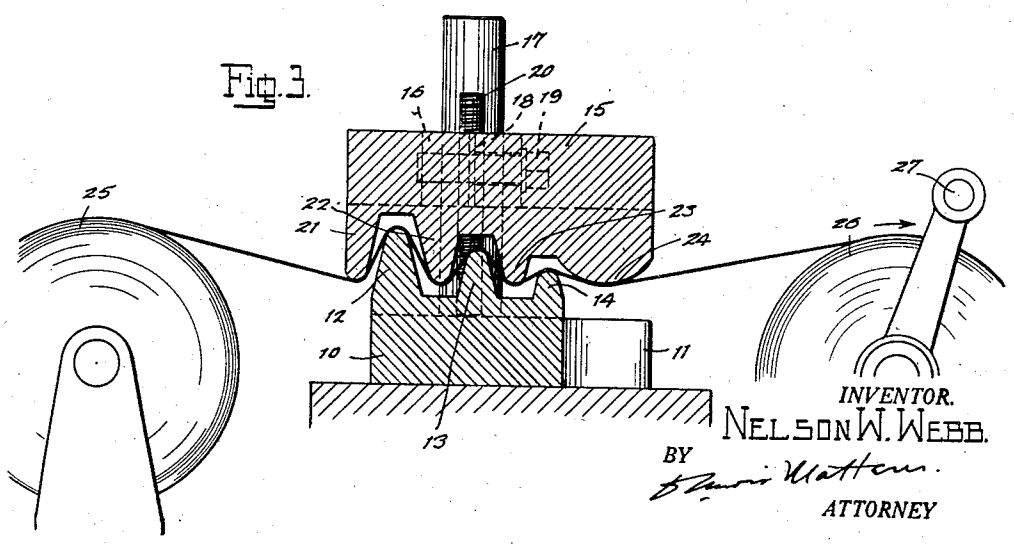



Fig. 3.




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Patented July 11, 1933 1,917,624

# UNITED STATES PATENT OFFICE

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## MACHINE FOR WORKING WIRE CLOTH

Application filed August 29, 1930. Serial No. 478,621.

The present invention relates to a machine for working wire cloth, and particularly such cloth as is used for Fourdrinier wire belts for paper making machines, although the machine will also prove advantageous for working wire cloth for other uses.

Fourdrinier wire cloth is of very fine weave and relatively large in area, some wires being as wide as 20 feet and as long as 80 feet. As the cloth is woven in the loom it is rolled upon a roller, and in order to remove the set or curl in the wire, so that it will lie flat, it is customary to draw and bend it over a so-called springer bar, this bar having a rounded elongated bending surface of relatively small radius, which engages one surface only of the cloth. Inherent irregularities in the weaving cause ripples or waves to form in the cloth, due particularly to the engagement of the springer bar with only one surface, with the result that the wire is not uniformly flat and the ends tend to curl in one direction or the other toward the longitudinal edges. This curling causes considerable difficulty in the production of the seam, and the finished seam is very often uneven and rough, so that it is not only apt to break in use, but produces a pronounced seam mark in the paper. Another objection to the springer bar is that any stoppage in the pulling of the wire cloth over it will mark the cloth at the point of stoppage due to the change of tension upon it.

An object of the present invention is to provide a machine which will not only remove the set or curl produced in the wire cloth in the loom, and will obviate the objectionable features of the springer bar, but will work the cloth to produce other advantageous characteristics, which will be of particular benefit in paper making wires, and also prove of value in other uses to which the wire may be put.

It is particularly proposed to provide a machine which will work the wire cloth so that it will be uniformly flat throughout its width and length, will iron out high spots in both sides of the cloth, and will tighten and flatten the knuckles, producing a more uniform wire thickness so that in use in paper machines fewer wire marks will show on the paper. The tightening of the knuckles stiffens the cloth against lateral twisting, and this is especially advantageous with coarse or loose weave wire which is ordinarily more or less slazy.

Another object is to provide a machine which will be compact, and in which the cloth may be uniformly worked for substantially its full length. A further object is to provide a machine which will work the wire in proportion to the natural set or curl produced in the loom, bending the wire to a greater extent in the direction opposed to the natural curl than in the other direction, so that the resultant worked wire will be uniformly flat, and any ripples or waves caused by irregularities in weaving will be effectually dissipated.

With the above and other objects in view an embodiment of the invention is shown in the accompanying drawing, and this embodiment will be hereinafter more fully described with reference thereto, and the invention will be finally pointed out in the claims.

In the drawing:—

Fig. 1 is a front elevation, with part broken away, of the machine according to the present embodiment of the invention.

Fig. 2 is a plan view thereof.

Fig. 3 is a transverse vertical sectional view and showing the wire being worked.

Referring to the drawing, the machine, according to the present embodiment of the invention, comprises a base 10, of such length as to permit the woven wire cloth to be worked to pass over it, and provided at its ends with bracket extensions 11 for securing it to a suitable support. Upon the upper surface of the base there are provided a series of spaced and parallel ribs or bars 12, 13 and 14 extending the full length of the base, the bases of these ribs being in the same horizontal plane while their upper rounded ends are disposed in an inclined plane, the first rib 12 being the greatest in height, while the last rib 14 is the shortest. The radii of the rounded surfaces of the ribs are preferably the same and the longitudinal side walls, which are inclined outwardly toward the

base, preferably have the same inclination.

A pressure beam 15 is adjustably disposed above the base and is provided at its ends with bracket extensions 16 adapted to be secured upon vertical posts 17 supported on the bracket extensions of the base, the extensions 16 being apertured and split, as at 18, and provided with a tightening screw 19 for clamping the same in vertically adjusted relation upon the posts. Vertical adjustment screws 20 are also provided in the bracket extensions 16 and bear at their lower ends upon the bracket extensions of the base and are adapted, upon releasing the clamping relation of the beam with the posts, to be turned to adjust the position of the beam with respect to the base, as desired.

Upon the under side of the beam there are provided a series of downwardly projecting ribs or bars 21, 22, 23 and 24 having their rounded end surfaces in the same horizontal plane, while the recesses between the ribs are of different depths to substantially correspond to the varying heights of the ribs of the base and which are disposed within these recesses. The radii of the rounded end surfaces of the ribs 21, 22 and 23 are preferably the same as that of the ribs of the base, and their longitudinal side surfaces are preferably inclined so that they are in opposed parallel relation to the side surfaces of said base ribs. The rib 24, which is disposed forwardly of the end rib 14 of the base, is of relatively greater width and its rounded surface has a relatively large radius adapted to compensate for the increasing diameter of each layer of wire as it is rolled on the receiving roll, so as to insure the uniform flatness of the wire through its entire length.

It will be seen that the cooperating ribs of the base and beam provide a tortuous path through which the wire cloth is pulled from the loom roll 25 to the receiving roll 26, this latter roll being turned either manually, as by cranks 27 provided at each end, or it may be geared to a suitable power source.

The operation is as follows:—

The wire cloth upon the loom roll 25 is carried through the space between the base and beam and secured to the receiving roll 26, and by turning the latter roll it is pulled between the wire working ribs, being bent first in one direction and then in the other and the extent of the bending gradually decreasing.

It will be observed that the bending through engagement with the downwardly projecting ribs of the beam is in the direction opposed to the natural set or bend imparted in the loom, and that the bending by the beam ribs, while gradually decreasing, is in each case slightly greater than the following bending operation in the opposite direction over the base ribs, and also that both the initial and the final bending are in the opposed direction to the natural bend, so that while both sides of the cloth are worked the bending is proportioned to overcome the natural bend and produce a flat wire cloth. The alternate kneading and bending not only straightens the cloth but dissipates ripples and wavy effects caused by irregularities in weaving. The cloth is furthermore subjected to an ironing pressure at both sides which eliminates high spots and flattens and tightens the knuckles, the flattening and tightening of the knuckles producing a wire cloth of uniform thickness so that when it is used for paper making the paper is more uniform and shows fewer wire marks. The wire will also go over the suction boxes of the paper machine more smoothly as there are no high spots to start grooving. The tightening or "setting" of the knuckles tends to stiffen the cloth and this is particularly advantageous in working wire cloth of coarse or loose weave, which is usually more or less slazy. By adjusting the space between the ribs more or less ironing effect may be obtained because of the increase or decrease in tension as the wire is pulled through the tortuous space. As the wire is held by the ribs under tension it is possible to stop the movement of the cloth therethrough at any time without danger of marking it.

It has been found that wire cloth that has been worked in accordance with the present invention is uniformly flat and free of waves and ripples, and that the ends of the cloth lie flat along their entire length without any tendency to curl in one direction or the other. In using the wire cloth for paper making wire belts this feature not only facilitates production of the seam, enabling the operator to more easily work upon it, but results in a seam of which will be flat and uniform, and will not buckle. The ironing effect produced by the machine flattens and tightens the knuckles, and gives inherent stability to the cloth.

I have illustrated and described a preferred and satisfactory embodiment of the invention, but it will be obvious that changes may be made therein, within the spirit and scope thereof, as defined in the appended claims.

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

1. In a machine for working wire cloth having warp and weft strands, a pair of superimposed members having a passage between them adapted to have the wire cloth passed therethrough, means adapted to adjust one of said members perpendicularly toward and away from said other member, a plurality of equally spaced projections carried by one of said members arranged parallel to said weft strands extending in one direction in said passage having rounded surfaces of uniform radius and diverging

side walls, said projections adapted to bend the wire cloth in one direction and iron it at one side, a plurality of equally spaced projections carried by the other of said members also parallel to said weft strands extending in the other direction in said passage into the spaces below said first projections and having rounded surfaces of uniform radius and diverging side walls disposed in parallel relation with the adjacent side walls of said first mentioned projections adapted to bend the wire cloth in the other direction and iron it at the other side, the projections at at least one side of said passage being of gradually decreasing height, whereby the successive bending of the wire cloth is of decreasing angularity.

2. In a machine for working wire cloth having warp and weft strands, a pair of superimposed members having a passage between them adapted to have the wire cloth passed therethrough, means adapted to adjust one of said members perpendicularly toward and away from said other member, a plurality of equally spaced projections carried by one of said members arranged parallel to said weft strands extending in one direction in said passage having rounded surfaces of uniform radius and diverging side walls, said projections adapted to bend the wire cloth in one direction and iron it at one side, a plurality of equally spaced projections carried by the other of said members also parallel to said weft strands extending in the other direction in said passage into the spaces below said first projections and having rounded surfaces of uniform radius and diverging side walls disposed in parallel relation with the adjacent side walls of said first mentioned projections adapted to bend the wire cloth in the other direction and iron it at the other side, and a projection in said passage in succeeding relation to said other projections and having a rounded surface of relatively larger radius, the projections at at least one side of said passage being of gradually decreasing height, whereby the successive bending of the wire cloth is of decreasing angularity.

Signed at Belleville, county of Essex, and State of New Jersey, this 15th day of January, 1930.

NELSON W. WEBB.