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PATENTED MAY 7, 1907.

D. F. DOHERTY & H. A. PALMER.
RATAN STRAIGHTENING MACHINE.

APPLICATION FILED JAN. 3, 1907.

2 SHEETS--SHEET 1.

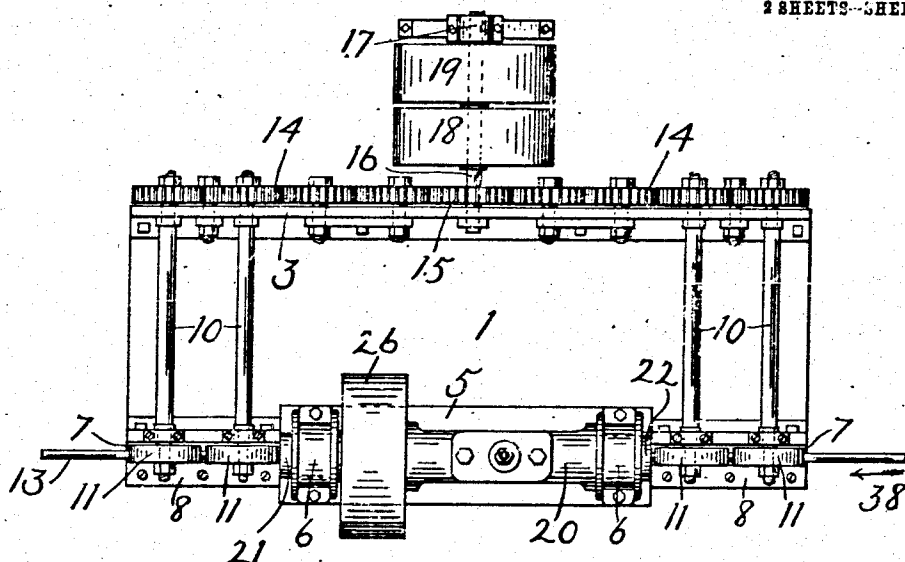


FIG. 1.

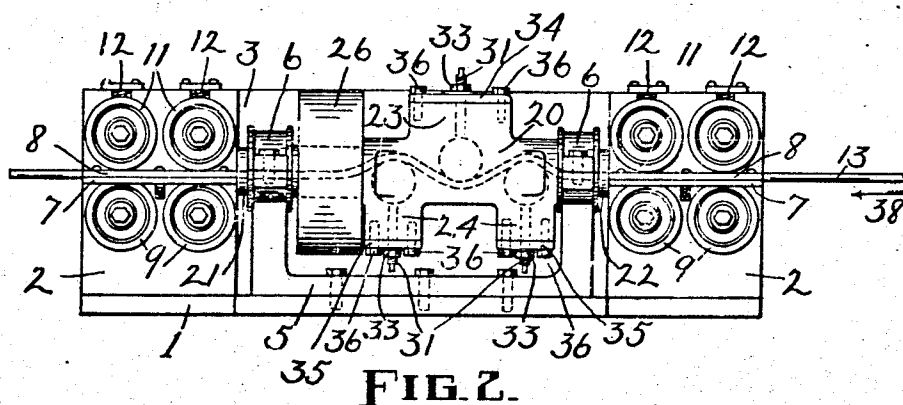


FIG. 2.

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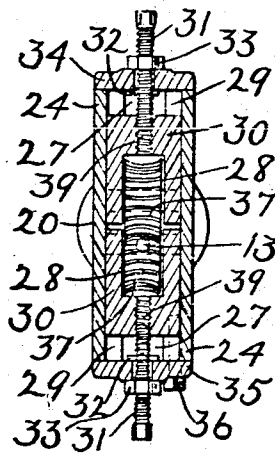
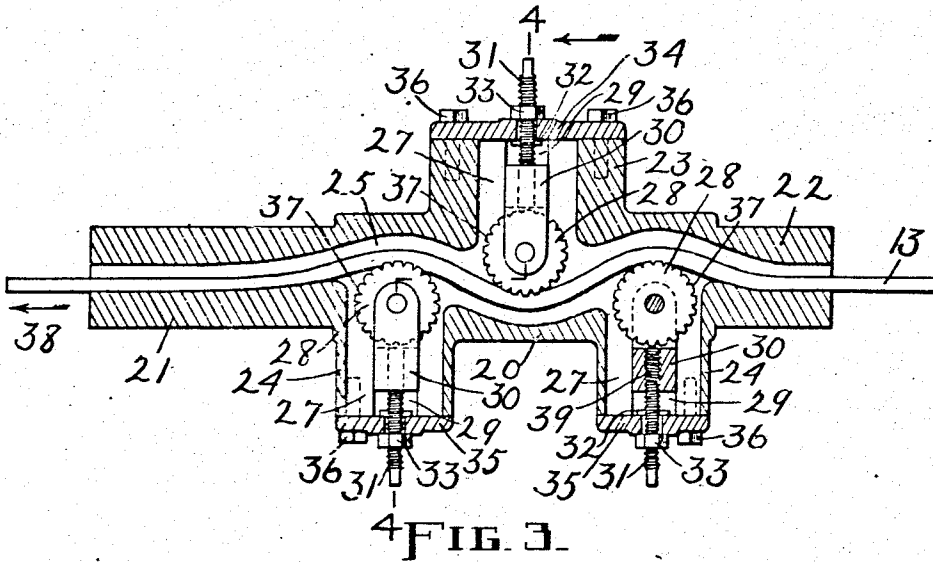
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UNITED STATES PATENT OFFICE.

DANIEL F. DOHERTY AND HENRY A. PALMER, OF WESTFIELD, MASSACHUSETTS, ASSIGNORS TO NEW ENGLAND WHIP COMPANY, OF WESTFIELD, MASSACHUSETTS, A CORPORATION OF NEW JERSEY.

RATAN-STRAIGHTENING MACHINE.

No. 852,826.

Specification of Letters Patent.

Patented May 7, 1907.

Application filed January 3, 1907. Serial No. 350,681.

To all whom it may concern:

Be it known that we, DANIEL F. DOHERTY and HENRY A. PALMER, both citizens of the United States of America, and residents of Westfield, in the county of Hampden and State of Massachusetts, have invented a new and useful Ratan-Straightening Machine, of which the following is a specification.

Our invention relates to improvements in means for straightening lengths of ratan designed for use in the manufacture of whips and for other uses where it is necessary or desirable that such lengths be straight, and consists essentially of a certain peculiar straightener provided with internal rolls, as hereinafter set forth.

The objects of our invention are, first, to provide means for mechanically or automatically making straight the raw material known as ratan preparatory to utilizing the same for manufacturing purposes, work which has heretofore been done by hand; second, to furnish mechanism for doing such work expeditiously and economically and better than can be done by hand; third, to provide means which not only straightens the ratan, but at the same time breaks up the hard, scaly, outer surface, sheath or integument of the same and thereby renders its condition for manufacturing purposes still better than if merely straightened out without destroying the integrity of the integument, and, fourth, to produce a comparatively simple machine in which is embodied in a practical manner straightening mechanism of the character outlined above. We attain these objects by the means illustrated in the accompanying drawings, in which,—

Figure 1 is a plan view of a machine embodying one form of our invention; Fig. 2, a front elevation of the same; Fig. 3, an enlarged longitudinal section of the straightener, one of its roll carriers being in section and the other two in elevation, and Fig. 4, a cross-section on lines 4—4, looking in the direction of the arrow at the top, in Fig. 3.

Similar figures refer to similar parts throughout the several views.

It is necessary to employ with the strictly novel features of our invention, such features consisting of a revoluble straightener having a tortuous passage extending lengthwise

therethrough and provided with grip rolls cutting into such passage, suitable feed mechanism for forcing the long pieces or lengths of ratan to be straightened into and drawing them out of said straightener. The mechanism for this purpose which we have shown in the first two views is very similar to feed mechanism common in ratan splitting machines, and comprises a series of friction rolls at each end of the straightener with the driving or actuating means therefor.

Referring now more particularly to the first two views it will be observed that a frame comprising a base 1, front pieces 2—2 and back 3 is provided. A U-shaped support or bracket 5, which is securely fastened to the base 1 between the front pieces 2, has at its upper ends two bearings 6. On the face of each piece 2, some distance below the top thereof, is a narrow horizontal ledge 7 which serves as a table for the ratan, and on top of this ledge or table at the front edge is a flange 8. Below each ledge 7 are two friction or feed rolls 9 on the front ends of shafts, similar to the shafts 10 above, suitably journaled in the front pieces 2 and the back 3. The rolls 9 operate through slots in the ledges 7 and project slightly above the upper surfaces of such ledges. Above each pair of rolls 9 is a pair of vertically movable friction or feed rolls 11 on the front ends of the shafts 10, said rolls 11 being normally held down on said rolls 9 by means of springs 12. The shafts 10 are journaled in the back 3 with a loose fit and are arranged in the front pieces 2 so as to have the necessary amount of vertical movement to permit the rolls 11 to be separated from the rolls 9 when a ratan rod 13 is introduced between the upper and under rolls; in this way provision is made for receiving ratan of any diameter and for affording the required degree of tension to force the ratan through the machine. The shafts 10 are driven by two trains of gears 14 in mesh with a central gear 15 at the back of the machine, and the shafts of the rolls 9 are driven from the gears on the shafts 10 by gears on the shafts below. Inasmuch as the whole feed mechanism is old and well-known it has not been deemed expedient to encumber the case with additional drawings to show the shafts and gears for the rolls 9.

The gear 15 is tight on a shaft 16 journaled in the back 3 and a support 17 and carrying tight and loose pulleys 18 and 19, respectively. Power is applied to the pulley 18 by

5 a belt not shown.

Passing to the straightener it will be seen that the same consists of a substantial body 20 provided with trunnions 21 and 22 at the ends and with a recessed central offset 23 on one side and two recessed offsets 24 spaced apart on the other side and having a passage 25 extending from end to end through the same, the passages or recesses in said offsets opening through the ends thereof and also into said passage 25. The walls of each of the aforesaid recesses in cross-section make a cross of the recess the longitudinal arms 27 of which cross are adapted to receive a grip roll 28 and the transverse arms 29 of which are adapted to receive a carrier 30 for such roll. The carriers 30 with their rolls 28 can be adjusted toward and away from the center of the body 20 in the recess guides or ways which form the walls of the recesses 27 and 29, but are prevented from turning therein. The rolls are loosely mounted in the inner forked terminals of the carriers. By preference the passage 25 is tortuous. The straightener has its trunnions 21 and 22 journaled in the bearings 6, which latter are so positioned as to bring the open ends of the passage 25 into line, approximately, with the bodies of the feed rolls 9 and 11, and said straightener is revolved through the medium of a pulley 26, tight on said trunnion 21 inside of its bearing 6, for a belt not shown. These parts may be revolved in either direction.

The arrangement of the rolls 28 is such that a line touching the inner or adjacent peripheries of all of them must be bent in the middle between the two end rolls, hence a flexible rod forced along the path between the three rolls will be made to assume for the time being a serpentine or undulating shape, and when it is remembered that in practice the rolls are carried around with the body 20, that is, that the axes of the rolls turn end over end, while such rod is prevented from turning by the grip of the feed rolls, it will be understood that the rod has every part undulated with the result that it loses all of the crooks and bends that might have formerly been in it and comes out perfectly straight. A wavy line connecting the inner peripheries of the rolls 28 follows more or less closely, of course, the outline of the passage 25.

The carriers 30 are held in place by means of screws 31, pins 32, nuts 33, plates or caps 34 and 35—35, and bolts 36, which members also provide for the longitudinal adjustment of said carriers. The cap 34 covers the outer end of the offset 23 and the caps 35 cover the outer ends of the offsets 24, the bolts 36 securely holding said caps in place. The inner

terminal of each screw 31 is in threaded engagement with a screw-threaded passage 39 extending longitudinally through the associated carrier 30, and the screw is held immovable relative to the cap 34 (or 35) through which it passes by one of the pins 32 on the inside of the cap and one of the nuts 33 on the outside of the cap, the pin being driven into the screw crosswise and extending on both sides thereof and the nut being screwed onto the same.

In order to remove the carriers 30 and rolls 28 from the straightener simply take out the bolts 36 when the caps 34 and 35 can be removed and said carriers slipped out of the recesses 29; then by taking off the nuts 33, removing said caps from the screws 31 and unscrewing the latter from the carriers the parts are separated. To readjust the carriers when the parts are assembled so as to cause the rolls to produce either more or less pronounced curves or undulations in the ratan, loosen the nuts 33, turn the screws 31 in the proper direction to force the carriers inward as much farther as may be necessary, the pins 32 bearing against the caps, and then reseat said nuts, on the one hand, and loosen the nuts, turn the screws in the opposite direction whereby they are screwed into the carriers to whatever further extent may be necessary, and then reseat the nuts after turning them to draw the screws and carriers outward until the pins contact with the caps, on the other hand. In this way any desired adjustment may be given the grip rolls. It is not necessary that all of the grip rolls be adjustable, but only one or two of them, where it is found that very little adjustment is required, and in some cases perhaps no provision of this kind need be made. The rolls 28 have concave peripheries to receive the rod 13, and by preference such peripheries are serrated or provided with teeth 37 which are more or less sharp, the object of which is to afford a better gripping surface for the ratan, and, furthermore, it insures the cutting or breaking of the integument of the ratan as said teeth are rapidly whirled around the flexible rod which is being forced between the rolls rotating them as it goes.

Ratan can be fed into the machine at either end since it makes no difference which way the feed rolls are run. The arrows 38 in the first three views indicate the direction of the ratan when it takes the course described below.

Assuming that the straightener is in motion and the feed mechanism also, the latter so acting as to make the right-hand end of the machine the receiving end, the operation of the machine is briefly as follows: One end of the ratan rod 13 is placed on the table 7 at the right and pushed between the first feed rolls 9 and 11 which immediately carry it forward between the next pair of feed rolls, un-

der the influence of these rolls the end quickly passes into the adjacent end of the passage 25, comes in contact with the first grip roll 23 which diverts it from its course, then encounters the second grip roll and is again diverted and finally the third grip roll which changes its direction once more; after passing the last grip roll the aforesaid end of the rod escapes from the straightener through the end of the passage 25 opposite that which it entered, passing out onto the second table and into the grasp of the feed rolls at this end of the machine which now assist the other feed rolls in forcing the rod through the grip rolls by drawing thereon while the first feed rolls continue to force it forward until the opposite end of the rod leaves the last-mentioned feed rolls. Meanwhile the grip rolls have been undulating the rod and breaking its integument and said rod leaves the last feed rolls straight and in a perfectly fit condition for use by the manufacturer.

The operation of the machine is rapid and the operator can follow the first rod with a second and that with a third and so on in a practically unbroken line until any number have passed through the machine and been straightened.

We do not desire to be restricted in the matter of shape, size and minor details of construction.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In a ratan straightening machine, a straightener comprising a revoluble body having a longitudinal passage therethrough and provided with exterior offsets having passages therein opening into such longitudinal passage, and grip rolls arranged with their peripheries extending into said longitudinal passage from opposite directions.

2. In a ratan straightening machine, a straightener, comprising a revoluble body having a tortuous passage of unchanging undulations extending longitudinally therethrough and provided with grip rolls arranged with their peripheries extending into the undulating portions of such passage from opposite directions.

3. The combination, in a ratan straightening machine, with a revoluble body having a tortuous passage therethrough of unchanging undulations and provided with grip rolls arranged with their peripheries extending into the undulating portions of such passage from opposite directions, of means to adjust

such rolls to position them farther in or farther out of such portions.

4. The combination, in a ratan straightening machine, with a revoluble body having a longitudinal passage therethrough and provided with lateral offsets having passages therein opening into such longitudinal passage, of carriers slidably mounted in the passages in said offsets and bearing against the sides of such passages, said carriers being provided with grip rolls the peripheries of which extend into the longitudinal passage, and means to secure said carriers in position.

5. The combination, in a ratan straightening machine, with a revoluble body having a longitudinal passage therethrough and provided with lateral offsets having passages therein opening into said longitudinal passage, of carriers slidably mounted in the passages in said offsets and bearing against the sides of such passages, said carriers being provided with grip rolls the peripheries of which extend into the longitudinal passage, caps over the outer ends of the lateral passages, and adjustable means for said carriers connected with said caps.

6. The combination, in a ratan straightening machine, of a revoluble member having a longitudinal passage therethrough and lateral passages opening into said longitudinal passage, carriers slidably mounted in said lateral passages, and grip rolls at the inner ends of said carriers with their peripheries extending into the longitudinal passage, the walls of the lateral passages being grooved to form ways for the carriers and also grooved to form ways for said rolls, and means to secure the carriers in place.

7. The combination, in a ratan straightening machine, with a revoluble member having a longitudinal passage therethrough and a lateral passage opening into said longitudinal passage, of a carrier slidably mounted in said lateral passage and provided with a grip roll the periphery of which extends into the longitudinal passage, a cap over the outer end of the lateral passage, a bolt passing loosely through said cap into threaded engagement with said carrier, a pin projecting from said bolt inside of the cap, and a nut on the bolt outside of the cap.

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Witnesses:

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