May 22, 1951 N. KIEHL 2,554,253

FEED WHEEL FOR WIRE WORKING MACHINES

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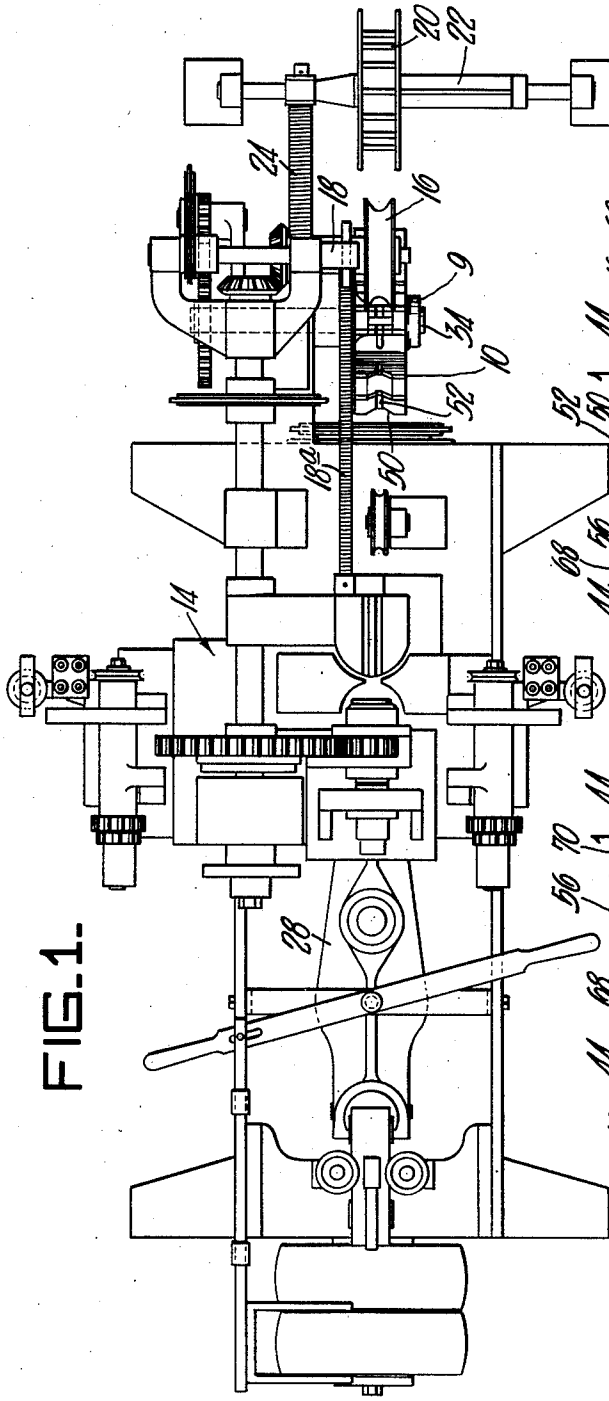

FIG. 1.

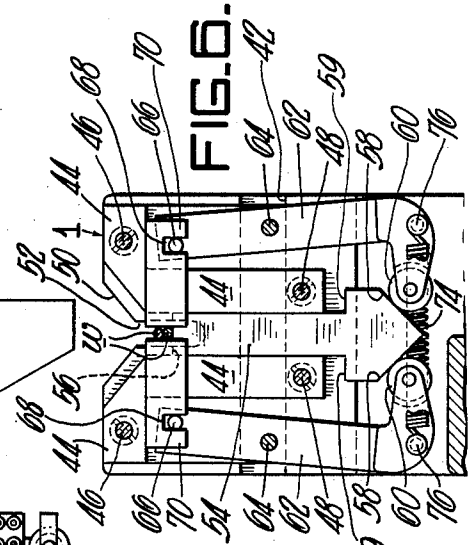

FIG. 6.

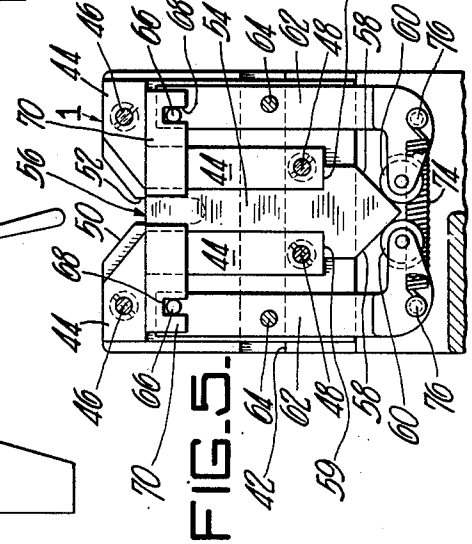

FIG. 5.

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FEED WHEEL FOR WIRE WORKING MACHINES

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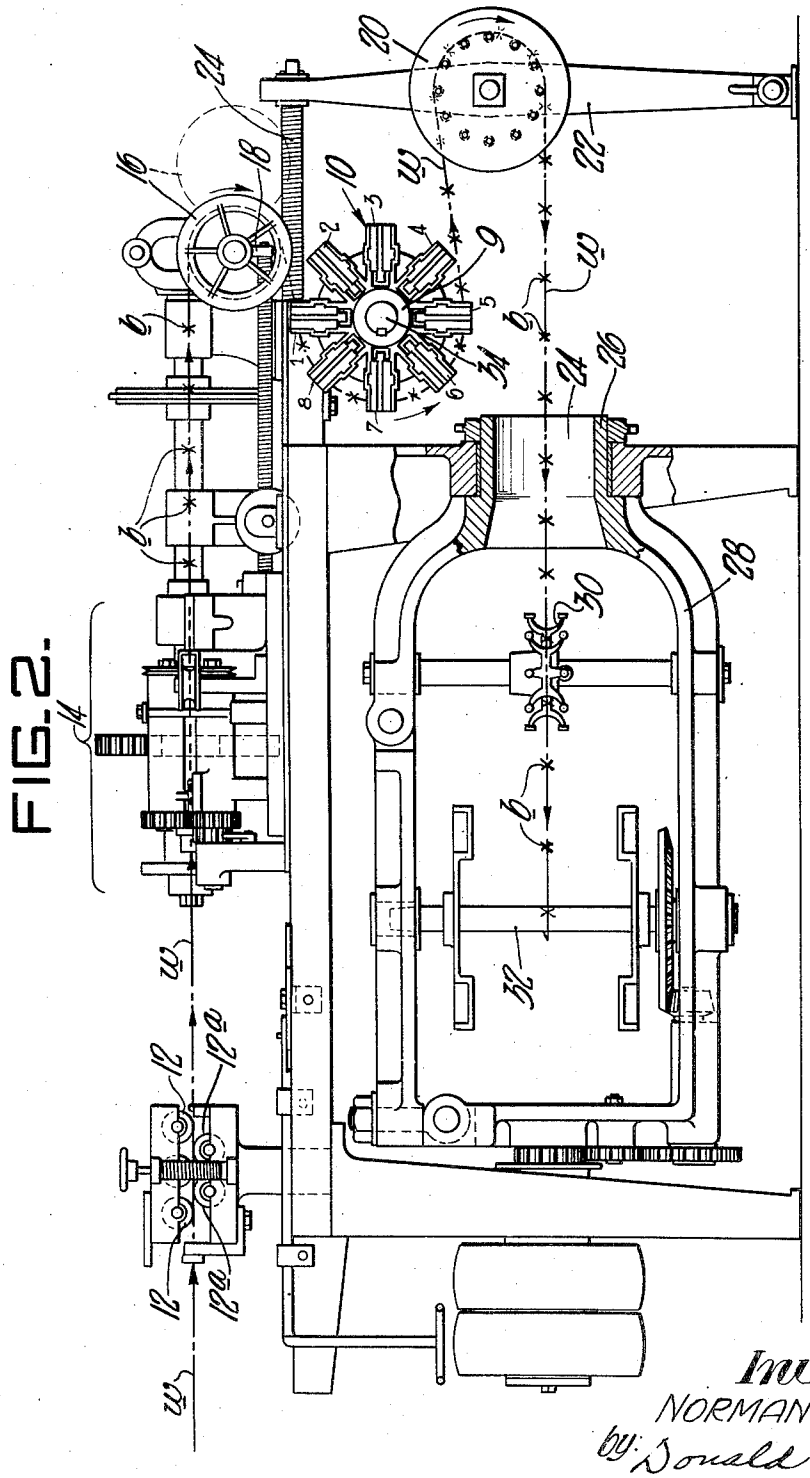

FIG. 2.

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FIG. 3.

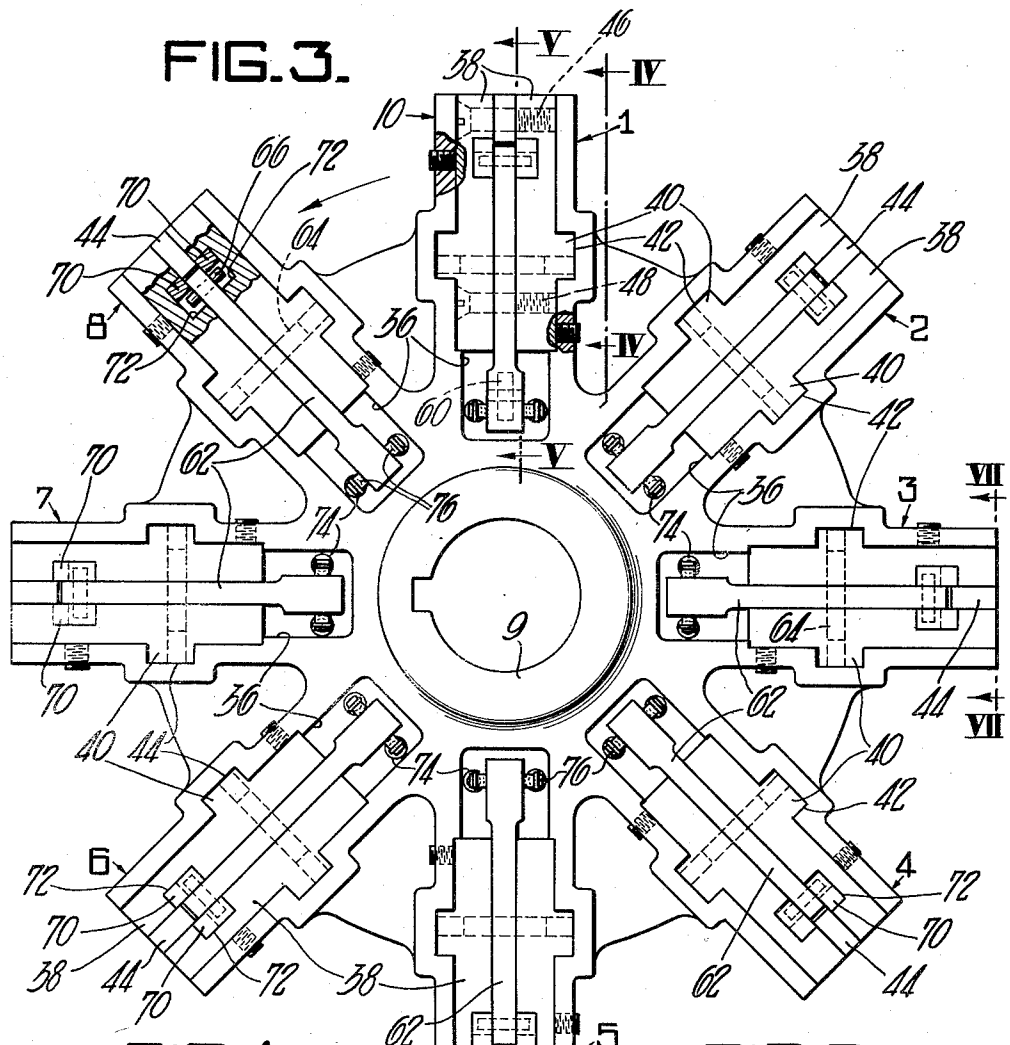


FIG. 4.

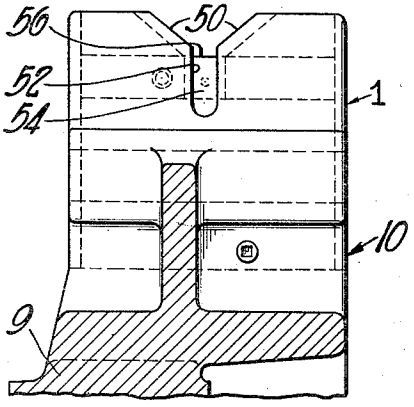
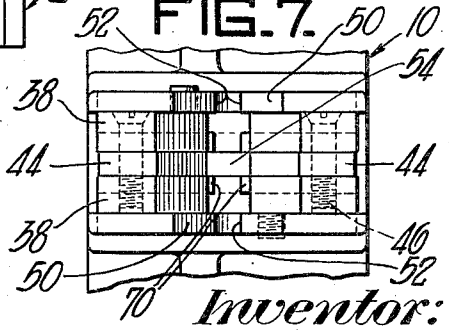


FIG. 7.



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2,554,253

FEED WHEEL FOR WIREWORKING MACHINES

Norman Kiehl, St. Louis, Mo.

Application March 28, 1947, Serial No. 737,753

4 Claims. (Cl. 140—127)

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The present invention relates to features of construction and arrangement of parts which, while not limited thereto, are peculiarly well-suited for pulling one or more line wires through a conventional type of barb-wire machine equipped with the usual mechanism for applying wire barbs to at least one of the line wires at spaced intervals.

The principal object of the invention is to provide an improved drag or feed wheel for wire working machines to insure that the wire being fed will be so positively gripped that there will be no relative slippage between said wheel and the wire during the feeding movement of the wire.

Another object is to so construct and arrange the component parts of the feed wheel that the tension of the wire or wires reeved thereabout exerts a gripping action on said wire or wires.

A further object is to so coordinate the wire feeding instrumentalities hereinafter described that they individually and jointly perform the functions herein set forth in detail.

For a more complete understanding of the invention reference should be made to the following detailed disclosure, the appended claims and the accompanying drawings in which:

Figure 1 is a plan view of a conventional type of barb wire machine to which my improved feed wheel is adapted to be applied;

Figure 2 is a side elevation of the machine of Figure 1, showing the relationship of the improved feed wheel to the other parts of the barb wire machine;

Figure 3 is an enlarged detail elevation of my improved feed wheel with parts shown in section;

Figure 4 is a section on line IV—IV of Figure 3;

Figure 5 is a section on line V—V of Figure 3, showing the wire grippers in non-gripping position;

Figure 6 is a view similar to Figure 5 but showing the wire grippers in gripping position; and

Figure 7 is an end elevation of one of the radial arms of the feed wheel and related grippers mounted therein, as viewed in the direction of the arrows of line VII—VII of Figure 3.

My invention is shown herein as applied to a conventional form of barb wire machine of the type shown in Kilmer Patent No. 479,985, dated August 2, 1892, my invention relating more particularly to a novel construction of feed or drag out wheel 10 to take the place of the wheel shown at S in said Kilmer patent.

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As is well known to those skilled in the art, barb wire is frequently made by feeding substantially parallel line wires through a machine equipped with a barb forming mechanism which twists barbs about at least one of the line wires.

In Figures 1 and 2 of the drawings I have shown enough of a conventional form of a barb wire machine to enable those skilled in the art to apply my improved construction of feed or drag wheel thereto.

Referring to Figure 2, two substantially parallel line wires *w*, only one of which appears in this figure, are fed from supply reels not shown through staggered rolls 12 and 12*a* which define an undulating pass effective to straighten the line wires, which then pass to a forming head 14 which includes conventional means for feeding barb-stock transversely of the line wires. The head 14 also includes means for twisting the barb-stock around one of the line wires and cutting off the barb-stock, thus the barbs *b* are applied to one of the line wires *w*. The line wires make a half turn around a pull-out wheel 16 carried by a spring loaded slidable support 18. The feed of the strand wires *w* is intermittent from the supply reels, through the straightener rolls 12—12*a*, through the head 14, where the barbs *b* are attached to a single line wire, up to and including the spring loaded pull-out wheel 16. From the pull-out wheel 16 the line wires *w* are continuously fed by means of my improved continuously driven feed or drag wheel 10, to a clock wheel 20 of conventional form which meters the length of barb wire being made. The clock wheel is mounted on a pivotally supported arm 22 which is urged to the right in Figure 2 by a spring 24 as shown. From the clock wheel 20 the wires *w* pass through the central opening 24 of the hollow trunnion 26 of a rotary flyer 28 and thence over a traversing guide sheave 30 to the take-up reel or spool 32 journalled in the flyer and driven by conventional gearing as shown.

The spring loaded pull-out and clock wheels 16 and 20 respectively maintain a continuous tension on the line wires *w* while they are passing around the feed or drag wheel 10. When the forming head 14 releases its grip on the line wire *w*, upon which a barb *b* is formed, the pull-out wheel 16 is urged by spring 18*a* from the full line to the dotted line position of Figure 2, thus causing the line wires to be drawn from the feed reels through the forming head 14 of the barb wire machine.

The continuously driven feed or drag out wheel 10, acting in conjunction with gripping action

of the forming head on the line wires will cause the pull-out wheel 16 to move to the left against the compressive action of the spring 18a. The elements of the machine are so constructed, arranged and timed that the forming head 14 releases the line wires *w* when the pull-out wheel 16 reaches the position indicated in full lines in Figure 2.

With the mechanism arranged and functioning as above described, it is important that there shall be no relative slippage between the line wires and the feed or drag wheel 10, since such slippage will result in an uneven or irregular spacing of the barbs *b*. Such irregularities of barb spacing has frequently occurred in machines not equipped with my improved feed or drag wheel 10 and has been responsible for improperly spaced barbs becoming fouled with the spokes of prior types of feed or drag wheels with the objectional result of causing stoppage of the machine and spoilage of the barb wire product.

To overcome such inherent defects in prior art types of drag or feed wheels I have provided means such as illustrated in detail in Figures 3 to 7 whereby the tension on the line wires causes a plurality of opposed slidable members in each of several radial arms of the feed or drag wheel to forcibly grip the line wires.

My improved feed or drag wheel 10 comprises a plurality of arms or spokes 1, 2, 3, 4, 5, 6, 7 and 8 radiating outward from the central hub 9, which is secured to the continuously driven shaft 34.

Each of the arms 1 to 8 is formed with a slot or cavity 36 to accommodate the wire gripping mechanism which is duplicated in each arm, therefore a description of the same for one arm will suffice for all.

Cheek plates 38—38 are mounted opposite one another in each cavity and are formed with tongues 40 which fit grooves 42 formed in the inner faces of the cavities of the arms. Keeper plates 44 are located between the cheek plates 38, as shown in Figure 7, and these parts are secured by screws 46 and 48, as shown.

The outer end of each arm 1 to 8 is formed with a flared portion 50 opening into a wire receiving notch 52. Slidably guided by the keeper plates 44 there is a trigger 54 whose upper extremity 56 is adapted to be engaged by and forced inwardly by the tension of one or both of the line wires *w*.

The inner extremity of the trigger is formed with a head having wedge-like cam portions 58 which coact with follower rollers 60 carried at the inner extremities of fingers 62 which are pivotally mounted on pins 64 secured to the cheek plates 38.

Near their outer ends the fingers 62 carry pins 66 which engage slots 68 in gripper slides 70 which make a sliding fit in guide slots 72 formed in the inner faces of the cheek plates 38.

Tension springs 74 anchored to pins 76—76 carried near the inner ends of the fingers 62—62 serve to retract the gripper slides to the non-gripping position of Figure 5 when the spokes of the feed or drag wheel move to such position that the wire tension is no longer exerted on the triggers. In Figure 2 the gripper slides of arm 1 are just beginning to grip the line wires *w*, in response to the tension thereof and the gripper slides of arms 8, 7, 6 and 5 all are firmly gripping the line wires. Since the gripper slides of the arms 4, 3 and 2 of Figure 2 have moved to positions beyond the influence of the tension of the line wires, it is apparent that they will be free to be moved to the release position shown in Figure 5 by the tension springs 74. When the tension springs 74 retract the gripper slides, they also cause the follower rollers 60 of the fingers 62 to shift the trigger 54 outwardly until the shoulders 59 come to rest against the inner ends of the keeper plates 44 which thus serve as stops for the trigger.

The construction and arrangement of the component parts of the drag or feed wheel, as herein shown and described, in such that a multiple grip is exerted on the line wires at each spoke of the wheel since there are four separate slidable wire engaging gripper slides 70 per spoke, two slides flanking each of the two actuating fingers 62. As thus arranged, the wear on the parts is more evenly distributed and compensated for over a long period of time thereby increasing the useful life of the parts and resulting in an important economic savings in maintenance of the feed wheel.

While I have described quite specifically a preferred construction which an actual reduction to practice has shown to be highly desirable, it is to be understood that the drawings and description are to be construed in an illustrative rather than in a limiting sense.

I claim:

1. A feed wheel for a wire working machine, comprising a hub having a plurality of spokes each having an inwardly converging flared portion opening into a wire-receiving radial notch, a respective pair of gripper elements slidably mounted on opposite sides of said notch, a respective pivoted finger having a pin and slot connection with each pair of said gripper elements, a trigger having a wire engaging portion slidable lengthwise of said notch and respective cam portions coacting with said fingers, the latter carrying followers engaging said cam portions, and springs forcing said followers into coaction with said cam portions.

2. In a barb wire machine having a barb forming head, a spring loaded pull-out wheel and a clock wheel carried on a spring loaded support, the improvement comprising a drag wheel including a hub having a plurality of radial arms whose outer extremities have flared portions opening into radial notches formed in said arms, said notches being adapted to have line wires reeved under tension therein which are enroute from said pull-out wheel to said clock wheel, multiple wire gripping slides on opposite sides of the notch in each arm, a respective trigger slidable radially in each arm adapted to be forced inwardly by the tension of a wire reeved about said arms, pivoted fingers operatively connected with said slides and arranged to move the latter into wire gripping position in response to an inward movement of said trigger, and yielding means tending to cause said fingers to release the grip of said slides on the wire upon the outward movement of said trigger when it is relieved of tension of the wire.

3. A feed wheel for wire working machines comprising a hub and a plurality of spokes radiating from said hub, each of said spokes including a hollow body having a wire receiving notch in its outer end, slidable wire grippers on opposite sides of said notch adapted to project into the notch for gripping opposed surfaces of wires, a pair of fingers pivoted to the inside of said body, each of which is connected to one of said grippers to project and retract the latter,

spring means acting on said fingers tending to retract said grippers, and a radially movable trigger in said body projecting into said notch and having cam faces adapted to rock said fingers against the action of said spring means, said trigger being adapted to move inwardly under the action of a wire entering said notch and, acting via its cam faces and said fingers, to project said grippers into engagement with the wire.

4. A feed wheel for wire working machines comprising a hub and a plurality of spokes radiating from said hub, each of said spokes including a hollow body, a pair of spaced apart cheek plates secured to the opposed inner faces of said body, said body and said cheek plates having a wire receiving notch in their outer ends, the inner faces of said cheek plates having opposed grooves, wire grippers slidably mounted in said grooves on opposite sides of said notch adapted to project into the notch for gripping opposed surfaces of wires, a pair of fingers pivoted to the inside of said cheek plates, each of said fingers being connected to one of said grippers to project and retract the latter, spring means acting on said fingers tending to retract said grippers, and a radially movable trigger between said cheek plates projecting into said notch and having cam faces adapted to rock said fingers against the action of said spring means, said trigger being adapted to move inwardly under the action of a wire entering said notch and, acting via its cam faces and said fingers, to project said grippers into engagement with the wire.

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