Sept. 10, 1968 W. K. RALSTON ET AL 3,400,653

SELF-STRIPPING WIRE TWISTER HOOK FOR WIRE BALERS

Filed Oct. 21, 1966

FIG. 1.

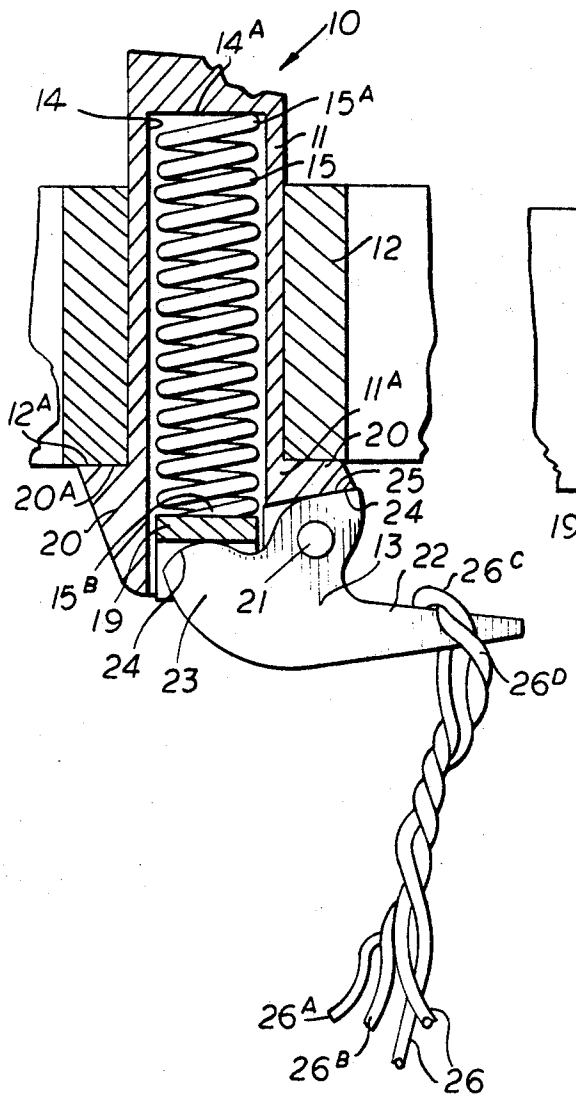
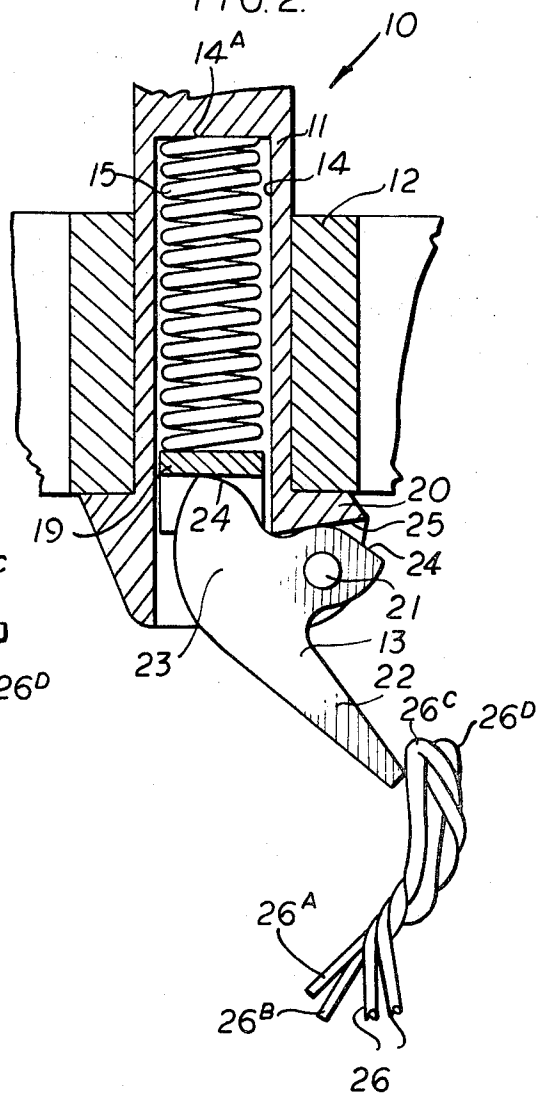


FIG. 2.



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SELF-STRIPPING WIRE TWISTER HOOK FOR WIRE BALERS

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4 Claims. (Cl. 100—31)

This invention relates to a twisting mechanism of the general type used in hay balers and more particularly to an improvement in a twister hook for such twisting mechanism.

The preferred embodiment of the present invention as disclosed herein contemplates that the novel twister hook be incorporated in a twisting mechanism of the type shown in the Raney Patent 2,513,967, issued July 4, 1950. In the twisting mechanism disclosed therein, a twister hook is used for twisting the ends of a strand of wire encircling a bale formed in a baler. At the conclusion of the twisting phase, a stripper finger is actuated forcing the twisted wire from the hook. The use of a stripper finger as the means for stripping the twisted wire from the hook is undesirable because it increases the complexity of an already complex mechanism. For example, the stripper finger must be actuated at precisely the right moment in the sequence of twisting operation. This requires modification of the other components of the mechanism in order that the stripper finger coordinate therewith. Furthermore, the stripper finger must be precisely adjusted to travel far enough out to dislodge the twisted wire from the hook.

A general object of this invention is the provision of a self-stripping twister hook, that is, a hook that requires no additional equipment for dislodging the twisted wire therefrom, thereby reducing the complexity of the twisting mechanism and simplifying the twisting operation.

Another object of the present invention is to provide a wire twisting mechanism having a self-stripping twister hook.

Still another object is to provide a twister hook which is rotatable in a given plane for twisting and pivotable to a stripping position.

These and other objects of the present invention will become apparent to those skilled in the art as a preferred embodiment of the invention is disclosed in the following specification and claims taken in conjunction with the drawings in which:

FIGURE 1 is a fragmentary side view, partly in section, of the novel twister hook contemplated by the present invention showing the twister hook in the twisting position; and

FIGURE 2 is, similarly, a side view of the novel twister hook but shown in its stripping position.

The preferred embodiment of the present invention as disclosed herein shows the novel twister hook incorporated in a wire-twisting mechanism of the type shown in the previously mentioned Raney patent. However, it should be understood that this is for illustrative purposes only in order to show the environment in which the novel hook operates, and that the novel features of the hook may be employed in other twisting mechanisms.

Referring to FIGURE 1 the wire twister device **10** constructed in accordance with the principle of the present invention comprises generally a twister hook **13** and a shaft **11** journalled to a housing **12**. It should be noted that the housing **11** carries other components of the twisting mechanism with which the novel hook presented herein cooperates. One of such mechanisms is described in detail in the U.S. Patent 2,513,967.

One end **11***a* of the shaft **11** is flared forming a radial

shoulder **20** which has an annular surface **20***a* engageable with a mating surface **12***a* formed in the housing **12**. The end **11***a* of the shaft **11** also has formed therein an axial recess **14** for receiving a compression spring **15**. One end **15***a* of the compression spring **15** engages a flat radial surface **14***a* bottoming the recess **14**, and an opposite end **15***b* carries a guide member **19**. The guide member **19** is particularly sized for free axial movement within the confines of recess **14**.

The hook **13** is pivotally mounted on the shoulder **20** by pin **21** and has integrally formed thereon a toe member **22** and a heel member **23**. With reference to the axis of shaft **11**, the toe member **22** and the heel member **23** respectively project radially outwardly and radially inwardly from the pivot point **21**.

As shown in FIGURE 1, the toe member **22** carries loops **26***c* and **26***d* formed in strand ends **26***a* and **26***b*, respectively. Rotation of the shaft **11** in accordance with the operation described in the previously mentioned patent causes the strand ends **26***a* and **26***b* to intertwist. Wire tension is borne by the toe member **22** at the point of engagement of the loops **26***c* and **26***d* thereupon.

The heel **23** has formed thereon an upwardly facing arcuate surface **24**. The guide member **19** forcibly engages the arcuate surface **24** of the heel member **23** biasing the hook **13** in the twisting position as shown in FIGURE 1 wherein a flat portion **24** of the hook **13** rests on a stop **25** formed in the shoulder **20**.

Thus, it is seen that forces are applied on opposite sides of the pivot point **21**. The strength of the compression spring **15** is particularly selected so that the moment of force created thereby acting upon the heel member **23** is always greater than that created by wire tension acting upon the toe member **22** during twisting operation.

At the conclusion of the twisting operation, the twister hook **23** occupies its home position, the toe member **22** projecting transversely with respect to the direction of movement of the bale encircled by strand **26**. In the operation of a conventional baler, a succeeding bale forces the formed bale rearwardly increasing the wire tension in strand **26**. The increased tension is brought to bear upon the toe member **22** through the engagement of loops **26***c* and **26***d* thereupon, increasing the moment of force about pivot point **21**. At a predetermined wire tension, the moment of force acting on the toe member **22** exceeds that acting on the heel member **23** causing the hook **13** to pivot about pivot point **21**.

The toe member **22** is pulled downwardly causing the heel member **23** to compress the compression spring **15** against recess bottom **14***a*. The force contact point between the guide member **19** and the arcuate surface **24** is always co-axial with respect to shaft **11** so that the forces are always transmitted in a direction concurrent the axis of shaft **11**.

Pivotal movement continues as the wire tension increases until the hook is disposed in the stripping position as shown in FIGURE 2. It should be understood that the pivotal movement is not snap acting, but a gradual process thereby allowing the intertwisted ends **26***a* and **26***b* to be tightened as the wire tension increases.

Obviously, many modifications and variations of the present invention are possible in light of the above teachings. It is therefore to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

What is claimed is:

1. A wire twisting mechanism for intertwisting opposite ends of a strand of wire encircling a bale formed in a baling machine, comprising a shaft rotatable about a fixed axis, a twister hook pivotally mounted on said shaft, said twister hook being pivotable about an axis between a first

position for rotation and a second position for stripping wire therefrom, biasing means operative upon said twister hook in a direction lengthwise of said shaft axis for biasing the said twister hook in said first position for rotation.

2. In the mechanism recited in claim 1 wherein the twister hook includes a toe member and a heel member, said toe member projecting from said pivot axis radially outwardly with respect to said shaft axis, said heel member projecting from said pivot axis radially inwardly with respect to said shaft axis.

3. A wire twisting mechanism as recited in claim 2 wherein the said biasing means imparts a force upon said

heel member, thereby biasing the said twister hook in the said first position for rotation.

4. A wire twisting mechanism as recited in claim 3 wherein the said biasing means includes a compression spring disposed concentrically with said shaft.

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