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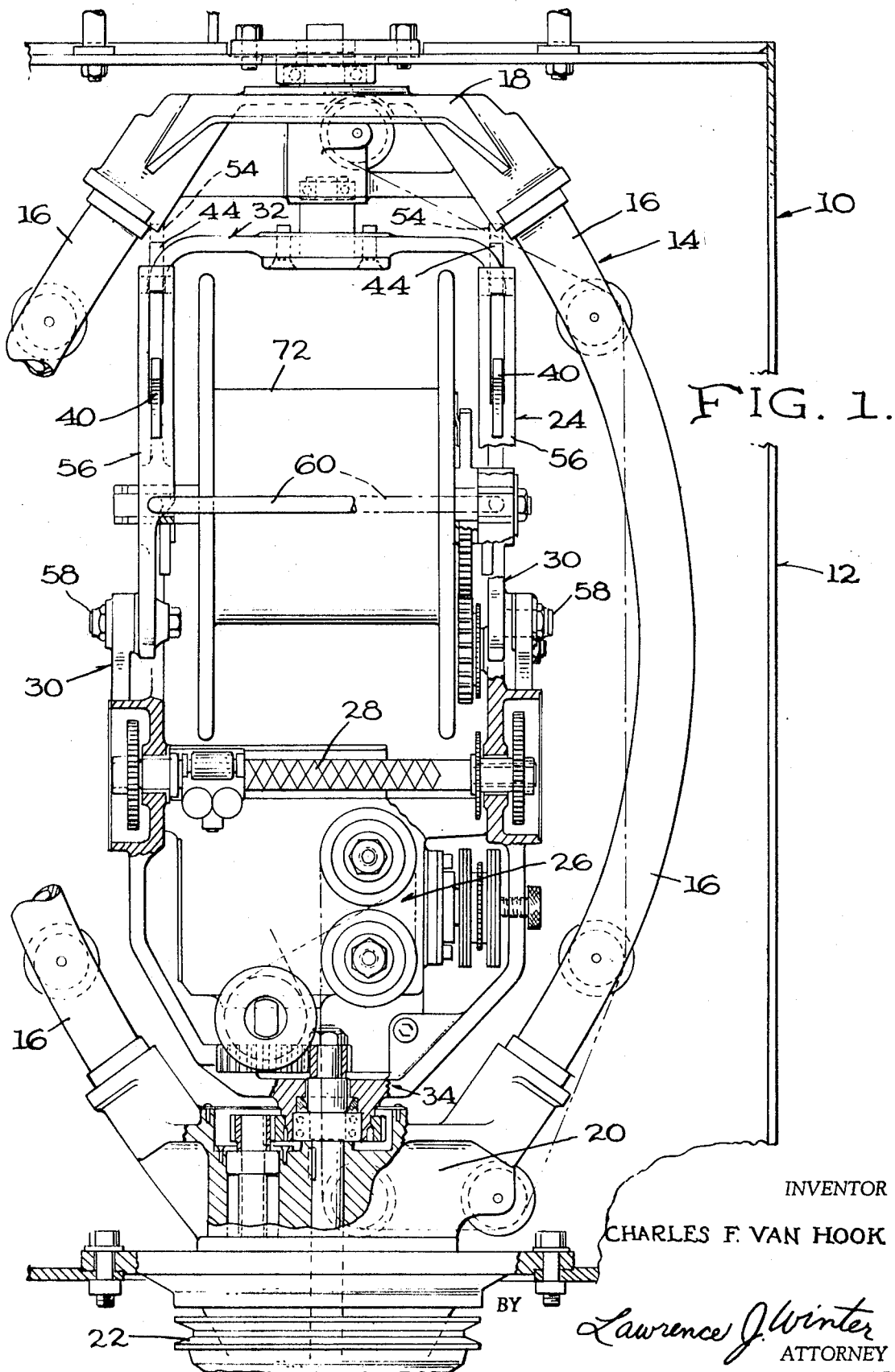
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LOCKING DEVICE FOR WIRE TWISTING MACHINE

Filed Aug. 5, 1969

2 Sheets-Sheet 1



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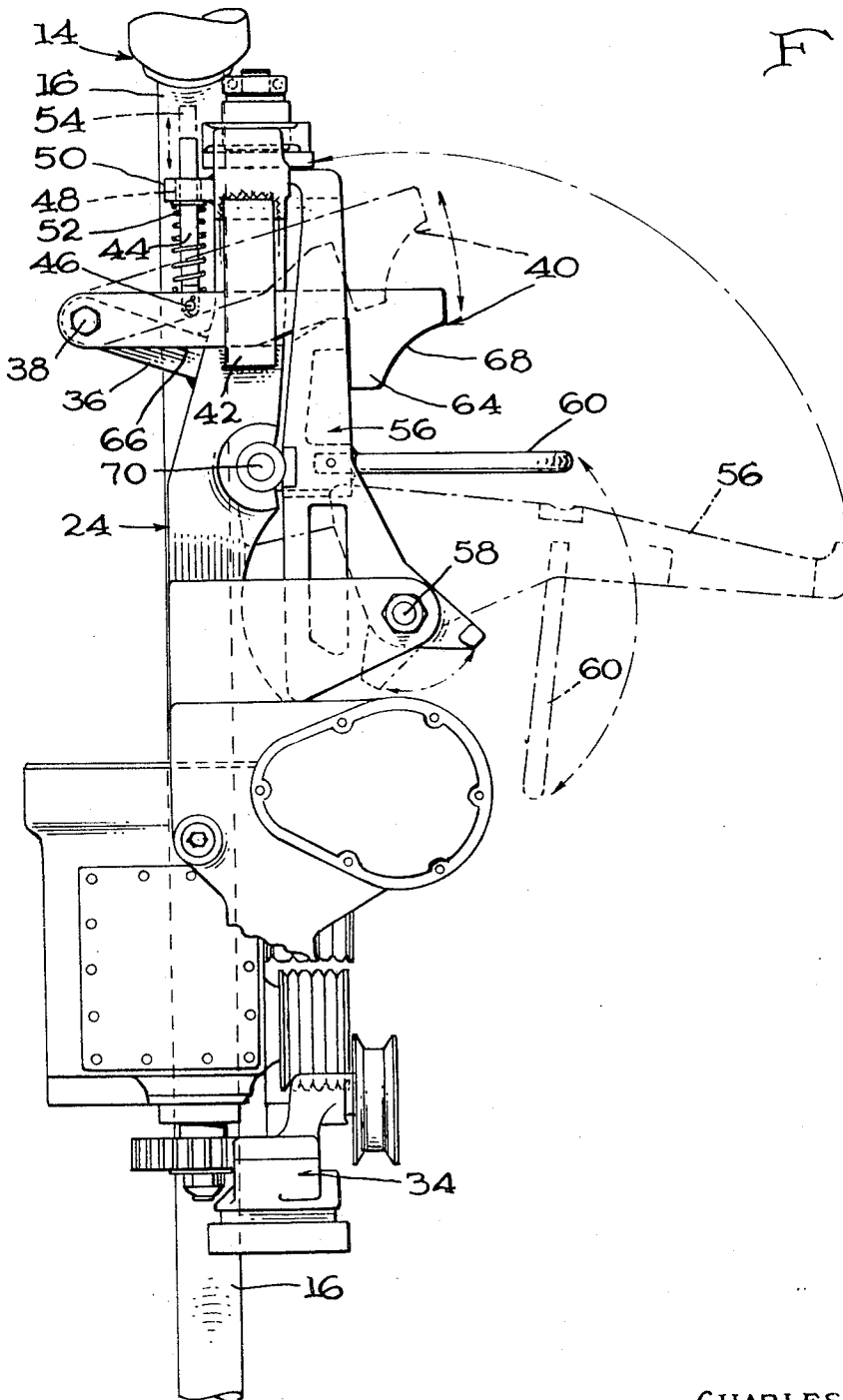
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INVENTOR

CHARLES F. VAN HOOK

BY

Lawrence J. Winter
ATTORNEY

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3,624,993 LOCKING DEVICE FOR WIRE TWISTING MACHINE

Charles F. van Hook, 2-31 Lyncrest Ave.,
Fairlawn, N.J. 07410

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9 Claims

ABSTRACT OF THE DISCLOSURE

A locking device for a wire twisting machine comprising a pair of latch arms adapted to be pivotally connected to the stationary cradle of a wire twisting machine and a pair of vertical rod members secured at their lower ends to said latch arms with biasing means mounted on said rod members to normally urge said latch arms in a downward direction. A pair of locking arms pivotally connected at their lower ends to the cradle of a wire twisting machine with said locking arms having slots therein adapted to receive the free end of said latch arms therein securing a spool on the cradle of the wire twisting machine with said rod members having elongated upper ends thereon adapted to be disposed in the path of rotation of the flyer of the wire twisting machine when said latch arms are in an unlocked position.

The present invention relates to locking devices for spools, and more particularly to a locking device for a spool that is disposed in the stationary cradle of a wire twisting machine.

It is an object of the present invention to provide a locking device for securing the spool on the shaft of a wire twisting machine in which the locking device interferes with the rotation of the flyer of the machine when it is not in a fully locked position.

It is yet another object of the present invention to provide a rugged and inexpensive locking device having a pair of latch arms with biasing means normally urging them in a downward locked position.

It is another object of the present invention to provide a locking device for the spool of a wire twisting machine having a stationary cradle and a rotatable flyer having a pair of cooperating latch arms which extend through a pair of cooperating locking arms for securing the spool on the machine.

It is another object of the present invention to provide a locking device for a spool on a wire twisting machine requiring a minimum amount of movement to lock the spool in running position on the machine and to unlock the spool so that it can be readily removed from the machine.

Various other objects and advantages of the present invention will be readily apparent from the following detailed description when considered in connection with the accompanying drawings forming a part thereof and in which

FIG. 1 is a front elevational view illustrating the locking means of the present invention shown positioned on a wire twisting machine having a stationary cradle and a rotatable flyer, and

FIG. 2 is a side elevational view of a portion of the machine illustrated in FIG. 1, illustrating the locking device in a loaded position and in an unloaded position.

Referring to the drawings, the reference numeral 10 generally designates a vertical twisting machine, such as that described in my earlier United States Patent 2,773,344, granted on Dec. 11, 1956. In such a machine, there is generally provided a housing 12 and the wire twisting machine is provided with a rotatable flyer 14

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supported in the housing and having two tubular arms 16, each in the shape of a portion of an ellipse and spaced 180 degrees apart about a vertical axis. The upper ends of the tubular arms 16 are connected to a rotatably mounted flyer head 18 disposed centrally thereof while the lower ends of the tubular arms 16 are connected to a rotatably mounted bottom flyer head 20. The rotatable flyer 14 is driven or rotated through a pulley 22, as described in my earlier patent, not forming part of this invention.

The vertical twisting machine includes a guide arrangement, such as described in my earlier patent, for guiding a plurality of threads thereto at the top thereof, and not forming part of this invention, and a stationary cradle designated generally 24, disposed centrally of the tubular arms and carrying a capstan drive unit generally designated 26, not forming part of this invention, with the usual adjustable traverse roller guide described in my earlier patent and indicated at 28.

The cradle 24, as described in my earlier patent, is stationary, and comprises a cage structure consisting of vertical side struts or members 30 and a horizontal top member 32 and a bottom member 34. The cage formed by the members, as best seen in FIG. 1, is disposed centrally of the rotatable flyer 14 so that the flyer 14 can easily rotate at a high speed around the stationary cradle without interference with any of the structure carried thereby. The means by which the cradle is maintained stationary and the flyer is rotated is described in my earlier patent, and does not form the invention hereof, as the locking device described hereinafter comprises the present invention.

Referring to FIG. 2, adjacent the upper end of the vertical side members 30, there is integral thereto diagonal lugs 36 which extend rearwardly or to one side of the side members 30. To the outer ends of these bars 36 is pivotally connected, as indicated at 38, a pair of latch arms 40. The latch arms 40 are positioned to move from their lowermost load or locking position, as indicated in solid lines in FIG. 2, to the dotted line position, or to a position above the horizontal plane, which is the unload or non-running position, or unlatched or unlocked position. The latch arms 40 are adapted to be swingable of the cradle 24 within two vertical bars 42 integral of the cradle, as best seen in FIG. 2. The latch arms 40 are provided with vertical rods 44 connected at their lower ends as indicated at 46 to the latch arms 40 adjacent their pivoted end 38. The upper ends of the bars 44 extend through an enlarged bore 48 in lugs 50 of the cradle 24 adjacent its horizontal member 32. A biasing spring 52 is mounted on each rod 44 and bears against the lug 50 and latch arm 40 so as to normally urge the arms in a downward direction to the horizontal position indicated in FIG. 2. These bars 44 are of sufficient dimension and length so that the upper ends or portions 54 of the bars, as indicated in dotted lines in FIGS. 1 and 2, interfere with or block the path of rotation of the flyer 14 when the latch arms 40 are in the dotted position indicated in FIG. 2, or in their raised position, as distinguished from the horizontal position illustrated in solid lines in FIG. 2.

The latch arms 40 are adapted to cooperate with a pair of locking arms 56 which are pivotally connected at their lower ends, as indicated at 58, to the vertical side members 30. The locking arms 56 are connected together by a substantially U-shaped rod or bar 60 and can be swung from an unlocked or non-running position, as indicated in dotted lines in FIG. 2, which is substantially a horizontal position, through an arc of approximately 90 degrees to a substantially vertical position, as shown in dotted lines in FIG. 2. The upper ends of the locking

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arms 56 are provided with elongated slots 62, as best seen in FIG. 1, for receiving the latch end 64 of the latch arms 40 therethrough. The latch end 64 depends below the lower surface 66 of the latch arms 40, as best seen in FIG. 2, so there is a positive locking or securing together of the locking arms and the latch arms 40. The latch arms 40 are also provided with a curved surface 68 adjacent the outer end of the latch end so that the operator of the machine may take the heel of his hand and lift the latch arms 40 from the horizontal position indicated in FIG. 2 to the unlocked position shown in FIG. 2 in dotted lines therein so that the bar 60 may be pulled down to the dotted line position shown in FIG. 2 to release the latch arms therefrom.

The cradle 24 is provided with a shaft 70 thereon for receiving a spool 72 thereon. The shaft 70 fits in a pair of notches in the cradle 24 and can be removed from the cradle so that the spool or reel 72 for the wire thereon can be positioned in the cradle and can be removed therefrom when it is full.

In operation, when it is desired to remove a spool 72 from its shaft 70 in the cradle, it is necessary to lift the latch arms 40 by using the hands of the operator and pressing upwardly against the curved surface 68 until they are in the dotted position illustrated in FIG. 2. Thereafter, the operator grasps the bar 60 and pulls it from the solid line position illustrated in FIG. 2, to the dotted position shown therein, at which time the locking arms 56 are in a horizontal position. Thereafter, the spool 72 is removed and the machine is in a non-running position.

At this time the rods 44 are disposed in the dotted position illustrated in FIG. 2 with their upper portions 54 disposed in a plane that blocks or obstructs the path of rotation of the flyer 14. Thus, the flyer is prevented from rotating until these arms are securely latched to the locking arms. Thus, the machine cannot be inadvertently operated at this time to cause the flyer to rotate as it is blocked from rotating and hence no damage can be done to the machine.

When the spool has been properly secured on its shaft 70 and the shaft disposed in its notches in the cradle, the bar 60 is rotated from the dotted line position shown in FIG. 2 and moves upwardly 90 degrees to the solid line position shown in FIG. 2 at which time the latched ends 64 pass through the slots 62 in the locking arms and abut against the surface of the locking arms below the slots 62, as illustrated in FIG. 1. At this time the rods 44 are disposed in the solid line position illustrated in FIG. 2 and the upper portions 54 thereof no longer interfere with the rotation of the flyer 14 and are wholly disposed within the perimeter formed by the flyer 14, as clearly illustrated in FIG. 1.

Inasmuch as changes may be made in the form, location and relative arrangement of several parts without departing from the essential characteristics of the invention, it is to be understood that this invention is not to be limited except by the scope of the appended claims.

What is claimed is:

1. A spool locking device for a wire twisting machine comprising a cradle having opposite side members, a pair of latch arm bars pivotally connected at one end

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to said side members to swing in a vertical plane from a point substantially above a horizontal plane to a point substantially adjacent said horizontal plane, biasing means normally urging said bars toward said horizontal plane, a pair of locking arms secured to said side members, and means for detachably securing said latch arms and said locking arms together.

2. The locking device of claim 1 wherein said locking arms comprise a pair of bars pivotally connected at their inner ends to said cradle side members and having a free end swingable from a horizontal position to a substantially vertical plane, said locking arms having slots therein to receive said latch arms bar therethrough.

3. The locking device of claim 2 wherein said biasing means comprise rods with spring means thereon, said rods having one end secured to said latch arm bars and at other end secured to lug means of said cradle side members.

4. The locking device of claim 3 wherein said cradle is disposed within a rotatable flyer and said rods extend out in a plane which blocks rotation of said flyer.

5. The locking device of claim 4 wherein said locking arms are connected together by a rod secured to their lower ends.

6. The locking device of claim 5 wherein said latch bars have a lower straight surface and a depending lug on their outer free ends which extend below said slots in said locking bars when said latch arm bars are disposed to allow flyer rotation.

7. The device of claim 6 wherein said flyer includes spaced ellipse shaped tubular members extending in a vertical plane.

8. The device of claim 7 wherein said cradle carries a horizontal shaft secured thereto by said locking and latch bars for placing a spool thereon.

9. A spool locking device for a wire twisting machine comprising a cradle having opposite side members, a pair of latch arm bars pivotally connected at one end to said side members to swing in one plane, stop means for said bars, biasing means normally urging said bars against said stop means, a pair of locking arms secured to said side members, and means for detachably securing said latch arm bars and said locking arms together.

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DONALD E. WATKINS, Primary Examiner

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