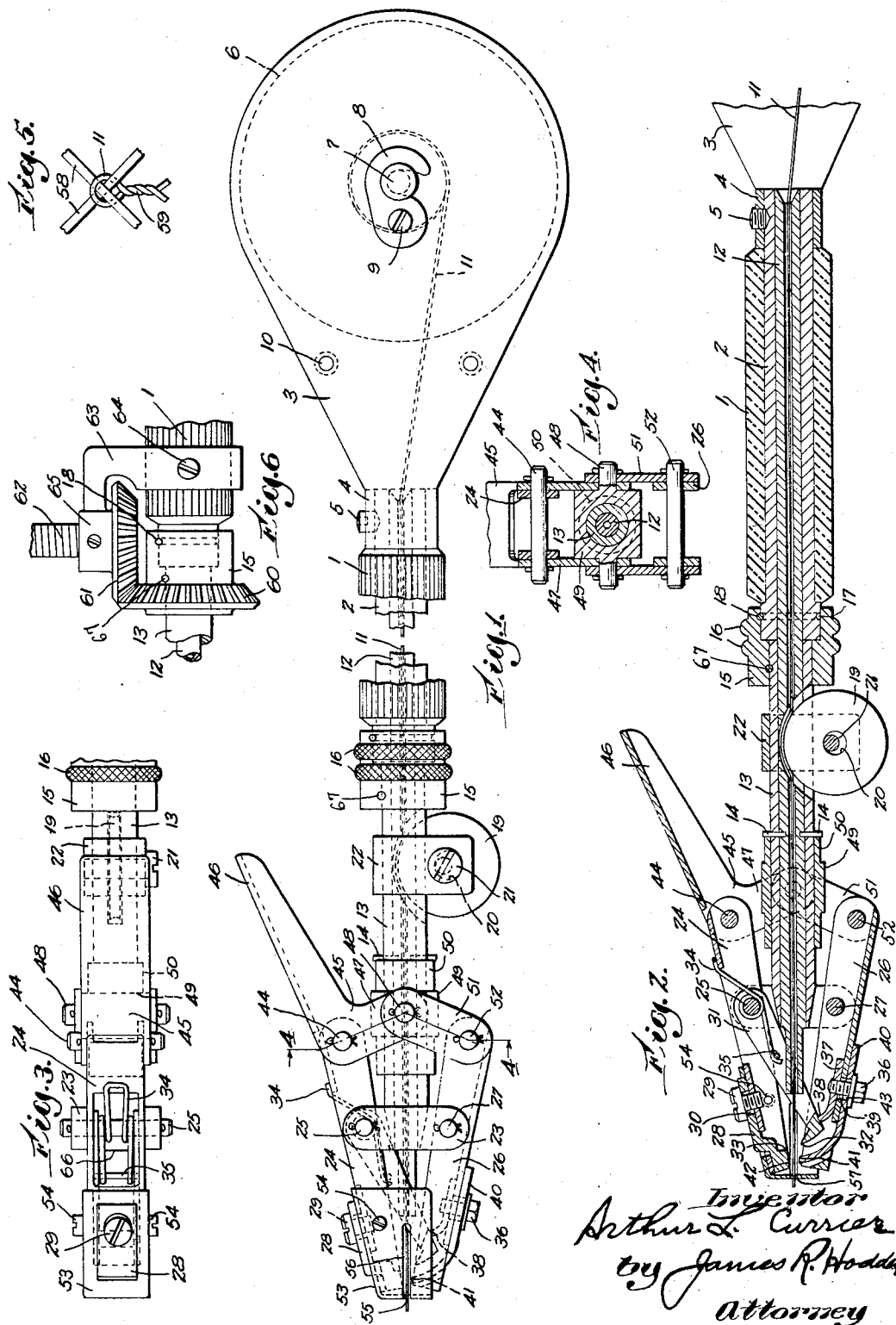


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WIRE BINDING DEVICE  
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## UNITED STATES PATENT OFFICE

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## WIRE BINDING DEVICE

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My present invention relates to a novel and improved wire binding machine or device.

There are many instances where it is desirable to bind single articles with a wire closure, such as bags or sacks, for example, and there are also many instances where it is desirable to unite a plurality of articles by a wire binding the same together.

Heretofore the binding of such articles with wire has been effected either manually or partly by hand and partly by means of a pair of pliers or the like. In each of these instances the binding operation is injurious to the hands of the operator, since the wire after being positioned around the articles to be bound must be twisted and severed.

An important object of the present invention, therefore, is the provision of a novel machine or device to effect the aforementioned twisting and severing.

Another object of the invention resides in the provision of a device of this nature associated with a supply of wire, means being provided to feed a predetermined or desired length of wire for the particular binding operation.

Another object of the invention resides in the provision of means to effect a shearing of the wire prior to the twisting thereof.

Another feature of the invention resides in the provision of means to grip the wire either prior to or simultaneously with the shearing thereof, so that said wire will be firmly held in the device for the twisting operation.

Another object of the invention resides in the fact that the entire working head of my novel device, including the feeding means, shearing elements, and gripping means, is rotatable with relation to the handle of the device, thus enabling the operator to rotate the head relative to the handle, while the wire is gripped in said head, thus effecting a twisting of the wire and a tightening of said wire upon the article or articles bound thereby.

Other objects and features of the invention reside in the particular construction and arrangement of my novel device and the parts thereof.

The above and other objects and features

of the invention, details of construction, combinations of parts, and advantages will be hereinafter more fully pointed out, described, and claimed.

Referring to the drawings, illustrating a preferred embodiment of the present invention,

Fig. 1 is a side elevation of my novel device;

Fig. 2 is a fragmentary longitudinal sectional view of said device;

Fig. 3 is a fragmentary top plan view;

Fig. 4 is a cross sectional view on the line 4-4 of Fig. 1;

Fig. 5 is a fragmentary detail illustrating the method of binding a plurality of articles with a suitable wire; and

Fig. 6 is a fragmentary detail illustrating a modified method of rotating the working head.

Referring now to the drawings, for a particular description of the invention, 1 designates a handle, ribbed longitudinally for efficient gripping thereof by the operator. This handle 1 surrounds a sleeve 2, the sleeve 2 projecting beyond the rearmost end of the handle 1, a spool holding frame 3 having a tubular end 4 fixed to the sleeve 2 by a set screw 5.

The frame 3 is adapted to hold a spool 6 mounted on a pin 7 held in position by means of a latch 8 pivoted at 9 on the frame 3, this frame preferably comprising two wings united by rivets or other means 10. The spool 6 carries a supply of wire 11, which is fed forwardly from said spool through a tube 12, said tube 12 being fixed within a sleeve 13 by pins 14 or in any other desired manner. The sleeve 13 is pinned by means of a pin 15 to a nut member 16 having knurled elements 17 for a purpose to be hereinafter more fully described.

The sleeve 2 is provided with an annular groove 18, a pin 19 extending through the nut member 16 and riding in the groove 18. Thus the nut member 16 is rotatable about the sleeve 2 while being held thereon by the pin 19. The wire 11, in its passage through the tube 12 is located under a knurled feeding disc or wheel 20 having a central bore 21 of greater diameter than the shaft 21 on which

said disc is mounted, the shaft 21 being carried by a substantially U-shaped frame 22.

The forward end of the sleeve 13 extends laterally to each side thereof, as at 66, and is provided with a pair of flange members 23, a frame 24 being pivotally mounted on the members 23 by means of a pin 25 and an opposite frame 26 being pivoted on the members 23 by means of a pin 27. The frame 24 carries a shearing plate or member 28, adjustable on said frame by means of a screw 29 and slot 30. Also carried by the frame 24 is an arm 31 having a shearing blade 32 for cooperation with the shearing edge 33 on the member 28. The arm 31 is split, as clearly illustrated in Fig. 2, to admit or accommodate the forward end of the tube 12.

A spring 34 surrounds the pin 25, and one end of said spring bears on the frame 24 and the other end on a pin 35 on the arm 31 to normally space the shearing blade 32 from the shearing edge 33. Mounted on the frame 26 and secured thereto by a bolt or set screw 36 is a shoe 37 having a lip 38 in constant engagement with the back of the arm 31 adjacent to the shearing end thereof. The frame 26 is provided with a slot 39 by means of which the position of the shoe 37 may be adjusted on said frame.

Also mounted on the frame 26 and secured thereto by the screw 36 is a resilient nipping or gripping member 40 having a forward end 41 adapted to engage a cooperating gripping face 42 on the forward end of the member 28. The resilient gripping member 40 is provided with a slot 43 by means of which the position of the gripping end 41 may be adjusted relative to the surface 42.

To the rear end of the frame 24 on the pin 44 is pivotally mounted a bell crank lever 45, the arm 46 on the bell crank lever 45 being adapted for manual engagement and manipulation, and the arms 47 of said lever 45 being pivotally connected to pins 48 projecting radially from a rectangular block 49 which constitutes an integral part of a sleeve 50; said sleeve 50 being slidable upon the sleeve 13. Also connected to the pins 48 are toggle links 51, the lower ends of said links being pivotally connected to the frame 26 by means of a pin 52.

Forward movement of the sleeve 50 is limited by the radial projection 66 on the sleeve 13, and rearward movement of the sleeve 50 is limited by the pins 14, although it will be appreciated that other means to limit the rearward movement of the sleeve 50 may be provided if desired, and that the sleeve 13 may be pinned or otherwise secured to the tube 12 at any desired point.

A shield 53 is fixed to the frame 24 by screws 54, this shield having a slot 55 through which the wire 11 passes, and having side slots 56 to permit dropping of wire clippings. The slot 55 is closed at one side, as at 57, to

insure against the wire 11 being displaced laterally away from the shearing edges 32 and 33.

The operation of my present device is simple and will be readily understood by those skilled in the art. Assume, for example, that it is desired to bind a pair of articles such as illustrated at 58 in Fig. 5. The wire feeding wheel 19 is rotated by the operator, pressure on said wheel during rotation effecting a feeding of the wire 11 past said wheel and out through the front of the device. If desired, the wire contacting edge of the disc 19 may be concaved, as illustrated in Fig. 3, for more efficient feeding, and said edge is also preferably knurled. After a predetermined length of wire 11 has passed through the front of the machine, said wire is then wound around the articles 58 and the free end returned through the front of the device until it is beyond the gripping edges 41 and 42. Thereupon the operator depresses the arm 46 of the bell crank lever 45, effecting a sliding of the sleeve 50 forwardly, and a straightening of the toggle consisting of the arms 47 and links 51. Just as the toggle passes its straight position, the shearing edges 32 and 33 will shear the wire 11, the gripping edges 41 and 42 grasping the wire 11 together with the free end thereof, either just prior to the shearing step or simultaneously therewith. Thereupon the operator releases the arm 46, and rotates the entire working head, by means of the knurled rings 16. This effects a twisting of the wire 11, as illustrated at 59, and a binding of said wire around the articles 58. When the binding action is completed, the operator raises the arm 46 of the lever 45, sliding the sleeve 50 rearwardly along the sleeve 13, and separating both the gripping edges 41 and 42 and the shearing edges 32 and 33.

By mounting both of the shearing elements upon the one frame 24, adjustment thereof is greatly simplified, as will be readily appreciated.

When utilizing my novel device with heavy wire, it may be desirable to effect the rotation of the working head to twist the wire by power operated means, and for this purpose I have illustrated a beveled gear 60 mounted on the nut member 15, said beveled gear 60 being engaged and rotated by a corresponding beveled gear 61 which is in turn rotated by a flexible shaft 62 driven from any suitable source of power. A bracket 63 is fixed to the handle 1 by a screw or screws 64, and has a bearing 65 to support the shaft 62 and beveled gear 61.

My present novel device is simple and inexpensive to manufacture, and is extremely efficient and simple to operate.

The advantageous features of said device will be instantly apparent to and understood by those skilled in the art, and since I believe

that my present wire binding machine is novel, I have claimed the same broadly in the present application.

While I have necessarily described my present invention somewhat in detail, it will be appreciated that I may vary the size, shape, and arrangement of parts within reasonably wide limits, without departing from the spirit of the invention.

My invention is further described and defined in the form of claims as follows:

1. In a wire binding device, a handle, a head, means to rotate said head relative to said handle, means to carry a supply of wire, cooperating adjustable shearing elements, cooperating adjustable gripping elements, means to feed said wire past both said elements, and means to effect simultaneous operation of both said elements.

2. In a wire binding device, a handle, a head, means to rotate said head relative to said handle, means to carry a supply of wire, cooperating adjustable shearing elements, cooperating adjustable gripping elements, means to feed said wire past both said elements, means to effect simultaneous operation of both said elements, and means to normally maintain said shearing elements in separated position.

3. In a wire binding device, a handle, a head, means to rotate said head relative to said handle, means to carry a supply of wire, cooperating adjustable shearing elements, cooperating adjustable gripping elements, means to feed said wire past both said elements, means to effect simultaneous operation of both said elements, and means to limit lateral movement of said wire relative to said elements.

4. In a wire binding device, a handle, a head, means to rotate said head relative to said handle, means to carry a supply of wire, cooperating adjustable shearing elements, cooperating adjustable gripping elements, means to feed said wire past both said elements, means to effect simultaneous operation of both said elements, and means to limit the opening and closing movement of both said elements.

5. In a wire binding device, a handle, a head, means to rotate said head relative to said handle, means to carry a supply of wire, cooperating adjustable shearing elements, cooperating adjustable gripping elements, said head having a wire carrying passage therethrough alined with said shearing and gripping elements, and means to feed said wire past both said elements.

6. In a wire binding device, a handle, a head, means to rotate said head relative to said handle, means to carry a supply of wire, cooperating adjustable shearing elements, cooperating adjustable gripping elements, said head having a wire carrying passage therethrough alined with said shearing and

gripping elements, and a wheel manually operable to engage the wire in said passage and feed said wire past both said elements.

7. In a wire binding device, a handle, a head, means to rotate said head relative to said handle, means to carry a supply of wire, cooperating adjustable shearing elements, cooperating adjustable gripping elements, means to feed said wire past both said elements, means to effect simultaneous operation of both said elements, and resilient means to normally maintain said shearing elements in separated position.

In testimony whereof, I have signed my name to this specification.

ARTHUR L. CURRIER.

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