

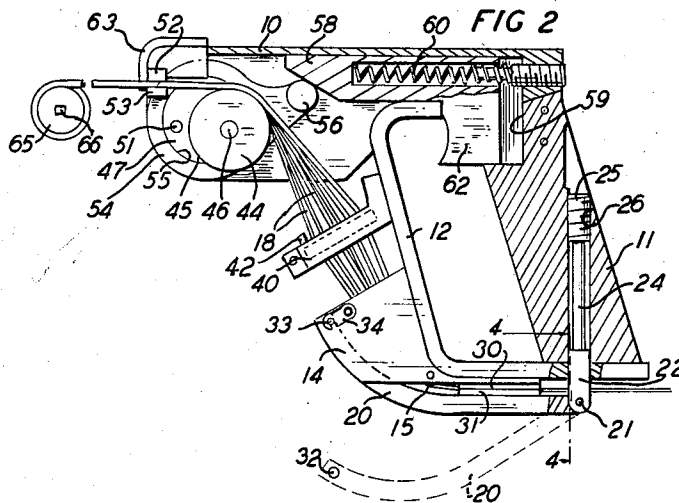
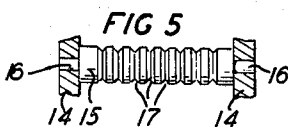
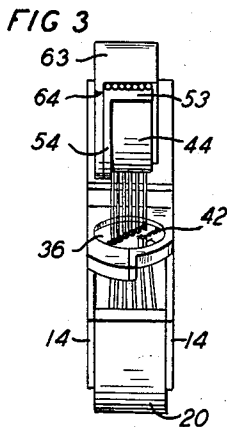
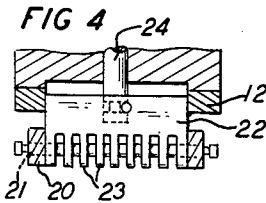
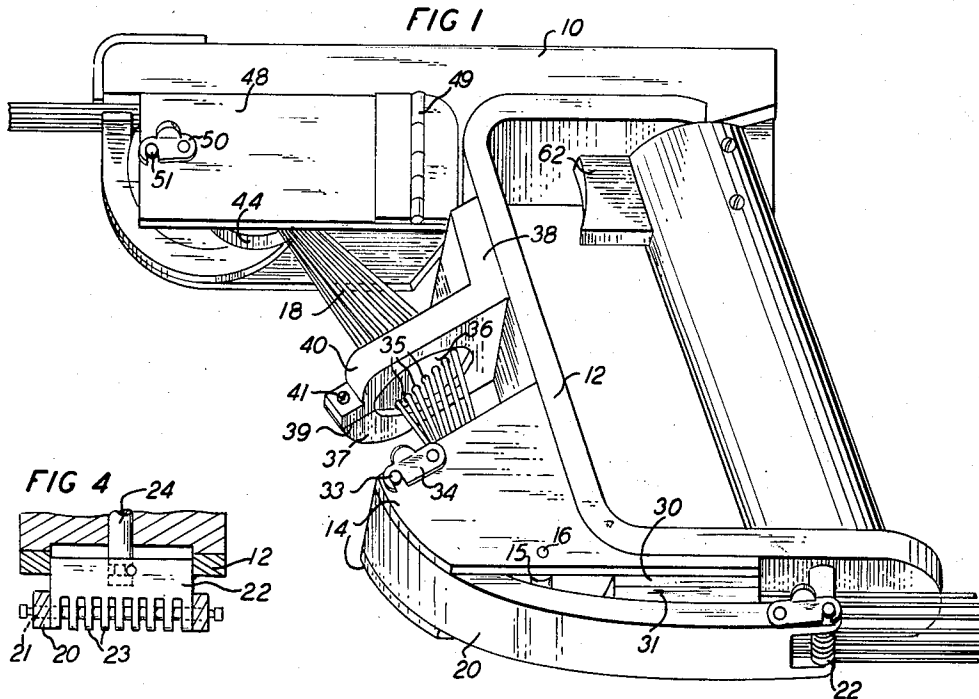
Feb. 3, 1959

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2,872,129

STRAND FEEDING TOOL

Filed Jan. 18, 1956



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2,872,129

STRAND FEEDING TOOL

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Application January 18, 1956, Serial No. 559,894

2 Claims. (Cl. 242—157)

This invention relates to strand feeding tools particularly hand tools for feeding groups of wires for winding multiple coils.

Certain types of coils used in the communication arts have been formed by hand, winding groups of insulated wires of various sizes and number on coil cores. In winding coils of this type the wires are selected from supply spools and it is desirable that these wires be provided with predetermined uniform tensions to produce uniformity in the convolutions of the wires on the coil cores. Furthermore, it is important that the wires be delivered to the cores with no space between adjacent wires and that the wires be held under like tensions between the completion of one coil and the beginning of another, that is, during the cutting and finishing operations.

The object of the present invention is a tool which, although simple in structure, is highly efficient in feeding strands in groups of varied numbers and sizes.

One embodiment of the invention according to the object is a strand feeding tool adapted to receive a plurality of strands at spaced positions, direct them from the fixture over a cylindrical type roller and provided with intermediate means to cause the adjacent strands to lie in close engagement with each other.

More specifically, the strand feeding tool is in the form of a gun having means supported by the handle to create variable tension in the strands as they pass through grooves of a guide roller to individually space the strands from each other. An alignment or positioning member interposed between the grooved guide roller and the cylindrical delivery roller has a row of apertures therein to individually receive strands of groups of various sizes, the member being adjustable in its holder to vary the positions of the strands of various sizes to cause them to lie closely adjacent each other as they pass over the delivery roller. Furthermore, a trigger actuated means normally clamps the strands against feeding movement until the trigger is actuated to open the clamping means.

Other objects and advantages will be apparent from the following detailed description when considered in conjunction with the accompanying drawing, wherein:

Fig. 1 is an isometric view of the strand feeding tool;

Fig. 2 is a vertical sectional view of the strand feeding tool shown feeding strands to a coil core;

Fig. 3 is a front elevational view of the strand feeding tool;

Fig. 4 is a fragmentary sectional view taken substantially along the line 4—4 of Fig. 2, and

Fig. 5 is a fragmentary detailed view of the guiding element or grooved roller.

The strand feeding tool is in the general form of a pistol to make it convenient for handling and operating. The tool includes a hollow body 10 having a handle 11 fixed thereto and to a guard 12. The guard has side members 14 fixed thereto by suitable means such as welding. A guide roller 15, having its spindle-like end 16 (Fig. 5) journaled in suitable apertures in the side mem-

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bers 14, is provided with spaced V-shaped grooves 17 to receive strands or insulated wires 18 individually. A threading gate 20, of the contour shown, is pivotally supported at one end by a spindle 21 carried by a yoke 22. The yoke has a series of slots 23 therein in the form of a comb to provide individual passageways for the strands or wires 18. The yoke 22 is supported by the lower end of a rotatable rod 24 having its threaded upper end 25 disposed in a threaded aperture 26 of the handle 11. A pad 30, of suitable material such as felt, is secured to the adjacent portion of the guard 12 and cooperates with a similar pad 31 fixed to the adjacent inner surface of the gate 20 to create predetermined uniform tension in the strands or wires. The other or forward end of the gate 20 is provided with an aperture 32 adapted for alignment with apertures in the side members 14 to receive a retaining pin 33, having a head portion (not shown) at one end and an annular groove in the other, the groove being adapted to receive a pivotal latch 34 to removably hold the pin in position. The pin 33 serves as a pivot for the gate 20 during adjustment of the yoke through rotation of the rod 24 to vary the pressure of the pad 31 on the pad 30 and thereby varying the cooperating pressures of the two pads on the group of strands or wires 18.

When the strands or wires 18 leave the grooved roller 15, they pass through individual apertures 35 in positioning member 36. This member is in the form of a disc, positioned with a portion of its periphery housed in an annular groove of a holder 37, mounted at 38 on the guard 12 and split at 39. One side 40 of the split holder 37 is reduced in thickness to cause it to be resilient and provided with a retaining screw 41 having its threaded end disposed in a threaded aperture in the thicker portion of the holder so that the resilient jaw or portion 40 may be moved toward the other, to clamp the member 36 in any desired position. A handle 42 (Fig. 3) suitably positioned on the member 36 may be employed to rotate the element in the holder when it is unclamped to effectively direct the strands or wires to closer or wider positions depending upon their sizes so that when they reach a delivery roller 44 they will ride over the roller in close engagement with each other.

The delivery roller 44 has a cylindrical peripheral surface 45 and is rotatably supported at 46 on a circular bearing member 47 disposed in and fixed to the body 10. The roller 44 is accessible when a door 48, hinged at 49 to the body 10, is open. A latch 50 pivotally mounted on the door 48 is adapted to interengage a groove pin 51 mounted on the bearing member 47.

A stationary clamping jaw 52 is fixed to the body 10 and is adapted to cooperate with a movable clamping jaw 53, supported by a rocking element 54, to clamp the strands or wires 18 which travel between the jaws as they leave the delivery wheel 44. The element 54 has an aperture 55 therein to receive the bearing member 47 and to utilize the bearing member as a pivotal support, about the axis of which the element may be moved to move the jaw 53 relative to the stationary jaw 52. A projection 56 of the element 54 is positioned to be engaged by a cam 58, slidably disposed in the body and in a cutaway portion 59 of the handle 11. The cam 58 is normally urged to the left (Fig. 2) into the clamping position by an adjustable spring 60. The cam 58 may be identified as a trigger cam in that it has a trigger portion 62 readily accessible to the operator for movement of the cam against the force of the spring 60 to free the cam sufficiently to allow the element 54 to rock to release the clamping effect of the jaws 52 and 53 on the strands or wires 18. A guide 63 is mounted on the body 10 and curves about the exit end to a position adjacent the path of the strands leaving the clamping jaws 52—53 with the exception of a portion 64 (Fig. 3) which extends further

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to limit the innermost position of the adjacent strand or wire.

Considering now the function of the strand feeding tool, it will be apparent that any desired number of strands or insulated wires may be threaded in their respective positions through the tool after the gate 20 is moved into its open dotted line position (Fig. 2) and the door 48 is unlatched and swung into its open position. After the strands have been threaded through the grooves in the guide roller 15 and through the apertures 35 in the positioning member 36, the trigger 62 may be actuated to allow the jaws 52—53 to open for feeding of the strands or wires in their respective positions therebetween and over the delivery roller 44. At this time, the strands may be fed to and have their leading ends secured in any conventional manner to a coil core 65 mounted on a rotatable mandrel 66. During rotation of the mandrel and coil core, the trigger 62 may be actuated to open the gripping jaws and allow the strands or insulated wires 18 to be fed to the core in their respective positions lying closely adjacent each other. The functions of the comb-like members 23 of the yoke 22 and the guide roller 15 with its grooves 17 are to individually locate the strands or wires with respect to each other and to prevent accidental displacement of any of the strands or wires. The pressure pads 30 and 31, through the adjustment of the gate 20, originating with the threaded portion 25 of the rod 24, produce the desired uniform tension in the strands or wires to bring about the desired winding of convolutions thereof on the coil core 65.

The tool may be employed for guiding strands or wires of various sizes and it is evident that the spacing of their center lines must vary with variations in their cross-sectional contours to assure side by side engagement of the strands or wires as they travel over the delivery roller 44 through the open area between the clamping jaws and to the coil core 65. This is brought about through adjustment of the positioning member 36, rocking in its holder 37, until the desired position is reached through the varying of the positions of the apertures 35 with respect to a plane perpendicular to the axis of the rollers 15 and 44. As a result of this adjustment, the strands or wires are directed to tangential areas, on the delivery roller 44, of varied widths and to varied spaced positions in those areas.

When the desired number of convolutions have been formed on the coil core 65, the trigger 62 may be released allowing the spring 60 to force the cam 58 against the portion 56 of the element 54 to close the clamping jaws on the wires or strands and thereby hold them taut during cutting of the strands.

It is to be understood that the above described arrangements are simply illustrative of the application of the principles of the invention. Numerous other arrangements may be readily devised by those skilled in the art which will embody the principles of the invention and fall within the spirit and scope thereof.

What is claimed is:

1. A portable strand feeding tool comprising a handle which may be gripped by an operator, a guard therefor

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mounted on the handle, an entrance element supported by the handle near one end thereof and adapted to receive and maintain longitudinally movable strands in predetermined spaced relation, a body supported by the handle near another end thereof, a delivery roller of a given length, having a cylindrical outer surface for all the strands to ride directly on during their longitudinal movement, supported for rotation by the body, means interposed between the entrance element and the delivery roller and supported by the guard to cause the spaced strands leaving the element to move in closely adjacent positions over the delivery roller, clamping jaws supported by the body for relative movement into open position, to free the strands for longitudinal movement from the delivery roller, and closed position to hold the strands leaving the delivery roller against longitudinal movement, and a member supported by the handle and normally urged in one direction to close the clamping jaws and hold them closed on the strands, the member being movable in another direction to free the clamping jaws for movement into open positions.

2. A portable strand feeding tool comprising a handle which may be gripped by an operator, a guard therefor mounted on the handle, an entrance element supported by the handle near one end thereof and adapted to receive and maintain longitudinally movable strands in predetermined spaced relation, a body supported by the handle near another end thereof, a delivery roller of a given length, having a cylindrical outer surface for all the strands to ride directly on during their longitudinal movement, supported for rotation by the body, means interposed between the entrance element and the delivery roller and supported by the guard to cause the spaced strands leaving the element to move in closely adjacent positions over the delivery roller, clamping jaws supported by the body for relative movement into open position, to free the strands for longitudinal movement from the delivery roller, and closed position to hold the strands leaving the delivery roller against longitudinal movement, and a trigger member carried by the handle and normally urged in one direction when released to close the clamping jaws and hold them closed on the strands, the trigger member being movable in another direction when gripped by the operator during gripping of the handle to free the clamping jaws for movement into open positions.

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