Feb. 4, 1969 K. C. SCHILLEBEECKX 3,425,203

CABLE MAKING MACHINE

Filed Dec. 30, 1966

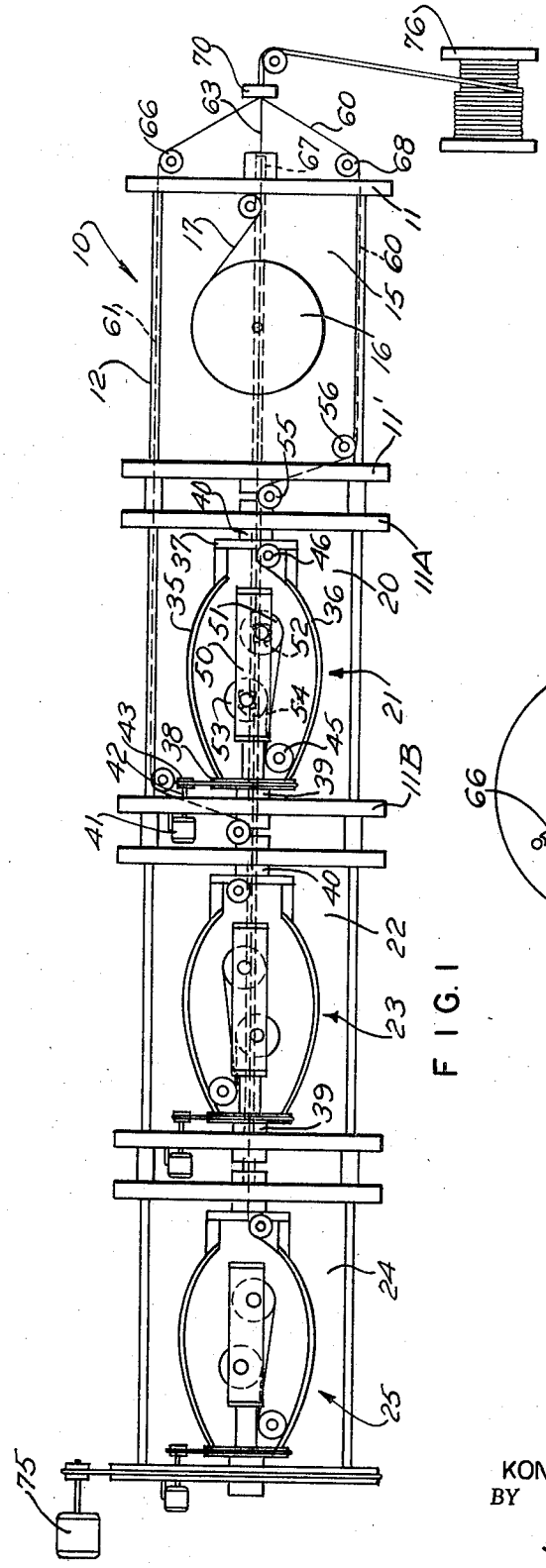


FIG. 1

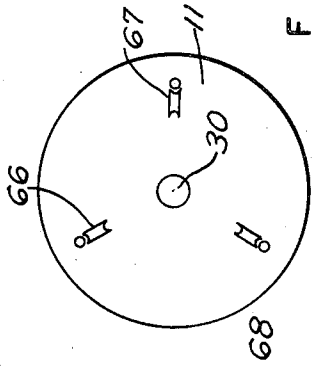


FIG. 2

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United States Patent Office 3,425,203
Patented Feb. 4, 1969

3,425,203

CABLE MAKING MACHINE

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Filed Dec. 30, 1966, Ser. No. 606,208
U.S. Cl. 57—58.36 4 Claims
Int. Cl. D01h 7/90, 1/10; D07b 3/04

ABSTRACT OF THE DISCLOSURE

A cable machine for twisting a plurality of pairs of twisted strands with each pair of said plurality or pairs being twisted together in the same machine as an initial operation and furnishing the pairs to be twisted together without intermediate reeling.

This invention relates to a cable machine for laying together a number of wires by a twisting operation so as to form a cable.

Heretofore, it has been usual to twist together two or more wires and then package the same such as on a reel, usually referred to as a pairing operation or a "pair." After the pairs are formed in one machine, then the pairs are put into a second machine and the pairs twisted together to form a cable, thus requiring several operations in order to arrive at the final result.

In contrast to the above this invention provides one operation or one machine for doing the complete work. The invention comprises the use of a plurality of units for twisting the wires together to form a pair, such for instance as cradles and flyers which are mounted in a single frame, which frame rotates with reference to each of these pairing units, picking up the products of each of the pairing units, and twists the pairs together into a final cable. The pairing units are arranged in tandem relation with each of the twisted pairs leading from the flyers of the unit to the common frame which twists the pairs together to form the cable. There can be as many numbers of pairs as desired by increasing the length of the frame, as the pairing units are in tandem relation. For example, each of the units of this invention may require about eleven feet. Thus, if three pairs were twisted together, the frame would be something in excess of forty or fifty feet, whereas if six pairs were twisted together, the frame would be in the neighborhood of eighty or ninety feet in length.

One of the objects of this invention is to provide in one operation or one machine a cable from twisted pairs as each of the pairs are twisted together without intermediate packaging.

Another object of this invention is to independently rotate the frame which twists the pairs together and the flyers which twist the strands to form the pairs, thus providing a means where different lays may be had in each of the pairs if desired and also a different lay may be had for the pairs in the final cable.

With these and other objects in view, the invention consists of certain novel features of construction as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings:

FIG. 1 is a view largely schematic and in elevation illustrating the arrangement of the invention; and

FIG. 2 is an end view showing the lead for the different pairs to the final closing die.

In proceeding with this invention, I have arranged in tandem relation in a frame a plurality of twisting units for twisting together a plurality of strands. The strands are twisted together in pairs in the usual manner and led

from the flyers to the frame in which the units are mounted and then along the frame to an end thereof where the twisted pairs are led over pulleys and then to a suitable closing die, the entire frame being revolved to twist together the pairs into a cable. Each flyer of the units is driven independently and the frame is driven independently from any of the flyers. Thus different amounts of lay may be utilized for each of the pairs if desired and a still different lay utilized with reference to the final cable lay.

With reference to the drawings, 10 designates a frame of any suitable length depending upon the number of pairs of twisted strands that are to be used in the cable. This frame is made up of spaced heads 11 of generally circular formation with bars 12 extending between the heads, there being two heads such as 11' and 11'' at intervals to provide operating spaces between the heads and the bars 12 of adjacent units of the frame. Thus, there is an area 15 between heads 11 and 11' in which there is rotatably located a reel 16 to provide for a center core 17 of the cable. There is another area between the heads 11A and 11B which I have designated as 20 and which provides an area in which there is located the pairing units, one of which is designated generally 21 in area 20. Similar additional areas 22 with a pairing unit 23 and area 24 with a pairing unit 25 are also provided and so on until the number of units which are to furnish pairs which are to be utilized in the cable are provided.

Assembly area 15 of frame 10 is suitably rotatably mounted upon trunnions underneath the spaced heads 11 and 11'. Assembly area 20 and all subsequent assembly areas of frame 10 are mounted and driven in the same way as assembly area 15 of frame 10. All these areas are mechanically but flexibly interconnected. Suitable means are provided to rotate this assembly so that the speed of the frame may be varied.

Each of the units 21, 23, 25 are the same and thus the description of one will suffice. There is a flyer, comprising a pair of bows 35 and 36, mounted by means of heads 37 and 38, which heads are in turn rotatably mounted on stub shafts 39 and 40 in the opposite heads of the area in which it is located. Some means for rotating this flyer on these stub shafts is provided, such for example as by means of a motor 41 secured to head 11B having a shaft 42 with a drive 43 extending to the head 38. This is an electric motor which rotates with the frame and is supplied by current from leads connected to slip rings and supplied by current to the slip rings. The motor may be of variable speed so that the rotation of one flyer may have a lay of two inches, another flyer have a lay of three inches and a third flyer have a lay of four inches, all as is desired.

A cradle 50 is hung on the ends of opposite stub shafts 39 and 40 by means of ball bearings and carries reels 51 mounted in bearings 52 and 53 mounted in bearings 54 supported by the cradle. This cradle rotatably supports the reels 51 and 53 so that the wire strands on these reels may be led from the cradle over suitable guides 45 and 46 carried by the flyer which pairs or twists together the two wires and then the twisted pair is led out through the stub shafts 40 over guides 55 and 56 carried by the frame 10. Each of these cradles is hung on ball bearings on the stub shafts and has sufficient mass to maintain it in a relatively stationary position, there being nothing to turn this cradle so that its own inertia will keep it substantially in a position of being stationary relative to the flyer which draws the strands from the reels and also relatively stationary with reference to the frame 10 which rotates about the reels 51 and 53.

The leads from each of the units 21, 23 and 25 extend along the frame 10 over pulleys supported by the bars 12

thereof, thus providing a twisted pair **60** from the unit **21**, a twisted pair **61** from the unit **23**, and a twisted pair **63** from the unit **25**. Each pair leads over its corresponding sheave such as **66**, **67** and **68** mounted to rotate with the head **11** and thence to the closing die designated **70** where the cable is formed. The rotation of the frame **10** may be such that the lay may be any desired amount, such for instance as twelve inches where the lay of unit **21** is two inches, the lay of unit **23** three inches, and the lay of the unit **25** four inches.

The frame **10** is driven from some suitable source of power such as indicated at **75** and the cable after passing through the closing die **70** is reeled as at **76**.

From the above it will be apparent that I have provided pairing units so arranged that each pair may be directed to a frame which rotates to assemble the pairs into a twisted cable in a single machine or in one operation.

What is claimed is:

1. In a cable machine, means for twisting a plurality of pairs of twisted strands comprising an elongated frame, means for rotatably mounting on its longitudinal axis and driving said frame about said axis, said frame carrying a plurality of units, each unit having means to twist a pair of strands together, and means to lead the twisted pair from each unit along said frame whereby a cable is formed of twisted pairs with said pairs twisted together in one continuous machine operation.

2. In a cable machine as in claim **1** wherein said units are in tandem with their axes on the axial center of rotation of said frame.

3. In a cable machine as in claim **1** wherein said units each have a rotating flyer and a relatively stationary cradle carrying the strands to be twisted together.

4. In a cable machine as in claim **1** wherein said units each have a flyer mounted to rotate about the axis of rotation of said frame and a cradle carrying the strands to be twisted together relatively stationary mounted within said flyer.

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U.S. Cl. X.R.

57—58.38, 58.55, 58.72, 59; 140—149