United States Patent [19]

Maillefer

[11] **3,806,052**

[45] **Apr. 23, 1974**

[54] **DOUBLE BOBBIN COIL WINDER**

[75] Inventor: **Charles E. Maillefer,** Renens, Switzerland

[73] Assignee: **Maillefer S.A.,** Renens (Canton of Vaud), Switzerland

[22] Filed: **Mar. 20, 1972**

[21] Appl. No.: **236,316**

[30] **Foreign Application Priority Data**

Apr. 20, 1971 Switzerland 6419/71

[52] **U.S. Cl.** ..... **242/25 A**

[51] **Int. Cl.** **B65h 54/02**

[58] **Field of Search** .... 242/25 A, 25 R, 18 A, 18 R, 242/79, 58.6

[56] **References Cited**

UNITED STATES PATENTS

2,913,191	11/1959	Nelson	242/25 A
3,098,621	7/1963	Nelson et al.	24/25 A
3,684,202	8/1972	Otani et al.	242/25 A
3,693,898	9/1972	Otani	242/25 A
3,695,525	10/1972	Otani	242/25 A

FOREIGN PATENTS OR APPLICATIONS

1,323,287	2/1963	France	242/25 A
832,651	2/1952	Germany	242/18 A

Primary Examiner—Stanley N. Gilreath

Attorney, Agent, or Firm—Stevens, Davis, Miller & Mosher

[57] **ABSTRACT**

A double bobbin coil winder having one bobbin in fixed position and another movable along its own axis from a winding position with its flanges parallel and aligned with the flanges of the fixed position bobbin to an unloading position axially offset from the winding position.

4 Claims, 3 Drawing Figures

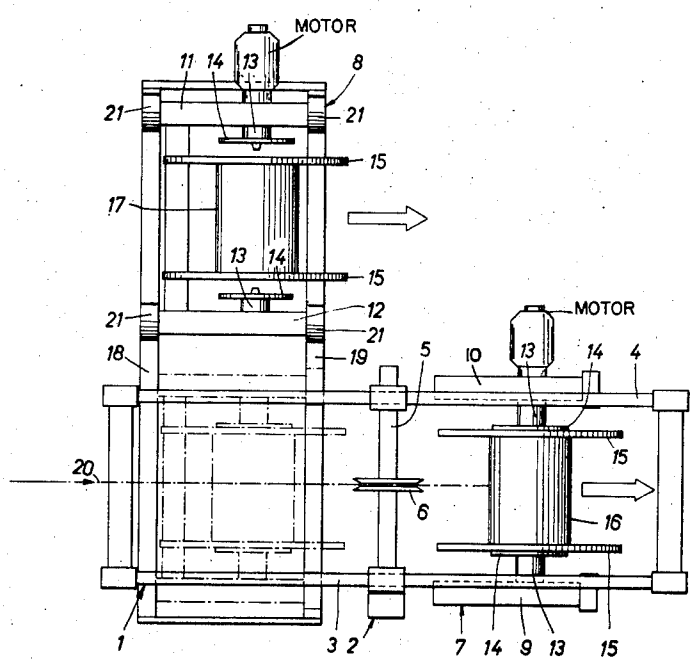

FIG. 2

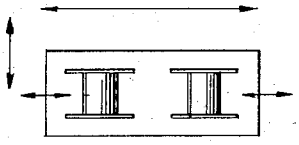

FIG. 1

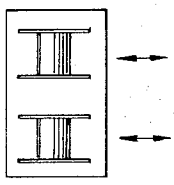

FIG. 3

DOUBLE BOBBIN COIL WINDER

Double-bobbin coil-winders are frequently made use of at the terminals of production lines, of facilities for wire drawing, insulating, sheathing, testing or control, such being designated hereafter by the term "line." For reasons of efficiency and ease of processing, it is often desirable to work without interruption, that is, without having to stop the line in order to fasten the thread-like component to the new bobbin when the previous one has been filled.

Generally, for double-bobbin coil-winders made to function continuously, the two bobbins are coaxial and placed end to end, or else they are arrayed so that their axes are parallel, each bobbin face being in the same plane as the corresponding face of the other bobbin. Feeding the wire or cable from the line to the coil-winder is simpler in the latter case than in the former because one does not have to deal with one or several angles. Coil-winding dynamics is easier to meet and if the wire or cable being wound on the bobbins is sheathed, the risks of damaging the sheath during winding are reduced. The wire arrives directly and in a straight line from the line at the coil-winder, moving along a direction perpendicular to the bobbin axes, while the transfer components only effect a to-and-fro motion in the direction of the wire above the bobbins so as to guide the wire towards one or the other of the bobbins.

However, up-to-date known facilities comprising parallel-bobbin coil-winders require more space than those with coaxial bobbin coil-winders, since two tracks for bobbin loading and unloading must be provided on either side of the coil winders and furthermore the handling means are more complex.

Also, it is necessary so to guide the thread-like element to be wound that it is sufficiently raised as to pass above the site of loading and unloading of the bobbin support which is near the line. Also one must provide sufficient space for removing the full bobbins and for bringing in the empty ones.

On the other hand, when the coil-winder is of the coaxial-bobbin type, the bobbins may be loaded and unloaded on the side opposite the production line, and this simplifies bringing in and removing the bobbins and also the wire guiding facilities between line and coil-winder.

The arrows in FIGS. 1 and 2 show the differences between those two types of coil-winders.

The goal of the invention is to achieve a double-bobbin coil-winder providing the same convenience in wire-guiding as the parallel-bobbin coil-winders but for which loading and unloading of bobbins is met by simpler handling and which requires less space than such coil-winders require as are already known.

To that end, the present invention is directed to a double-bobbin coil-winder for thread-like components that will wind continuously and comprises two bobbin supports each equipped with bobbin pivoting means in which the axes of said pivoting means are parallel to each other. A transfer scheme ensures hooking up an empty bobbin placed on one of the supports to the coil-winder the moment when the bobbin on the other support is full, without therefore interrupting the winding of said component. The invention is characterized by one of the bobbin supports being movable in the direction of its axis, so that it may be laterally displaced, together with the bobbin, when the other one is being wound.

FIGS. 1 and 2 schematically show two kinds of known coil-winders and

FIG. 3 is a diagrammatic top view of an embodiment of the coil-winder according to the invention.

FIG. 3 shows a frame 1 upon which is fastened a transfer device 2.

This frame comprises two horizontal rails 3 and 4 allowing the traverse pulley 6 to move lengthwise from one end to the other. Transfer devices and means for moving the traverse pulley are conventional as shown in U. S. Pat. No. 3,098,621 and French Pat. No. 1,323,287. Transfer device 2 is shown in the drawing as being combined with a reducing device which, in another embodiment, however, might be separate. Traverse support 5 may also be fastened on a pivoting arm. Frame 1 is so elevated that it allows two bobbin supports 7 and 8 to be housed underneath it. These diagrammatically shown bobbin supports each comprise two flanges 9, 10 for support 7 and (flanges) 11, 12 for support 8. These flanges support coaxial bearings in which rotate shaft elements 13. Driving and centering plates 14 are fastened to the ends of the shaft elements. These plates are meant to grip the external faces of flanges 15 of both bobbins 16 and 17. Flanges 9 and 10 may be separated from or brought nearer one another so as to permit assembly of bobbin 16 between plates 14. Support 7 is fastened underneath frame 1, the common axis of its two shafts 13 being horizontal and normal to the direction of rails 3 and 4. On the other hand support 8 is fastened on a carriage the rollers 21 of which roll on transverse rails 18 and 19 with the latter being approximately at ground level and perpendicular to rails 3 and 4. The carriage bearing support 8 may move between the position indicated by dot-dash lines—which is the winding position—and the position shown in solid lines—which is the loading and unloading position. The motors (not shown) driving bobbins 16 and 17 during winding are ganged to each of these bearing supports 10, 11. Thus the motor driving the bobbin on the movable support 8 moves along with that bobbin when the support is brought to the loading and unloading position.

Support 8 is shown in the drawing in solid lines in its loading and unloading position. Shafts 13 may be axially moved by the action of jacks. The shafts are in a pulled-in position, so that bobbin 17 has been wholly released from its support. Further shown in dot-dash lines are the support in its winding position and bobbin 17 wedged between plates 14 so that it may be rotated by its driving motor. To ensure loading and unloading, the described coil-winder comprises means for accepting bobbins not shown in the drawing but that may consist of a lift for bringing the bobbin axis up to the level of shafts 13 or else a device for moving shafts 13 upwards so as to fetch the ground-level bobbins.

To move the carriage bearing support 8 within the winding position shown in dot-dash lines and the loading and unloading position shown in solid lines, one may for instance provide a jointed chain system or a cable system, driven by a gear-train motor. The motor then is ganged to the carriage or one may use any other suitable means. The displacement is sufficiently rapid so that when the winding of the bobbin on the movable support is terminated, the operations involving moving the carriage, releasing and evacuating the full bobbin

and emplacing an empty one, and returning the carriage into winding position, may occur before the other bobbin is full.

Diagrammatically and by dot-dash lines, the drawing shows the arrival **20** of a thread-like element such as a wire or a sheathed cable from a line near movable support **8** and along a direction parallel to rails **3** and **4.** The wire **20** thus arrives directly from the production line, without being bent. However, in another embodiment, a pulley with a vertical axis could be provided above the left end of the frame **1** in order that the thread-like element can arrive from a direction parallel to the rails **18** and **19** and not to the rails **3** and **4.**

Clearly, for the coil-winder shown in the drawing, the removal of the bobbins will take place in accordance with the arrows. The bobbin arrival and departure path is shortened and simplified with respect to the arrangement of FIG. **2.** Further, no bobbin is to be moved in the space between the coil-winder and the production line, so that the coil-winder may approach the production line and therefore one achieves lesser space requirements.

It has been noted that the arrangement described above allows not only reduction of space requirements, but also a decrease in handling time.

Several lines of several coil-winders of the kind described above may be placed side by side, wire arrivals occurring all parallel to arrival **20.** In such a case, the lines may be located one very near the other. Bringing in and removing the bobbins may then be engineered.

In another embodiment, the two bobbin supports may be moved along the bobbin axis.

What is claimed is:

1. A double bobbin coil-winder for thread-like elements, for continuous winding, comprising two bobbin supports each provided with a pair of rotatable coaxial shafts for supporting and driving one bobbin, the axes of both pairs of shafts being parallel, and a transfer device ensuring the start of winding for an empty bobbin mounted on one of the supports at the instant when the bobbin on the other support is full, without interrupting the winding of said elements, the improvement that comprises means mounting one of the bobbin supports for movement along the direction of the axis of said shafts in such fashion as to allow its own lateral displacement together with the bobbin it is supporting, during the winding of the other bobbin.

2. A coil-winder according to claim **1,** characterized in that the movable bobbin support is mounted on a carriage which may move on at least one rail parallel to the bobbin axes, between a winding position in which the flanges of the bobbin it is supporting are located in the same plane as one of the flanges of the bobbin supported by the other support, and a loading and unloading position in which the bobbin it supports is entirely laterally shifted with respect to the other bobbin support.

3. A coil-winder according to claim **1,** characterized in that the movable support is provided with a motor for driving the bobbin.

4. A coil-winder according to claim **1,** characterized in that the transfer device is located above the bobbin supports in such fashion it may shift in a sense perpendicular to the bobbin axes.

* * * * *