Oct. 22, 1963 B. R. CARTER 3,107,576

BRAIDING MACHINE BOBBIN AND CARRIER

Filed Aug. 30, 1961 2 Sheets-Sheet 1

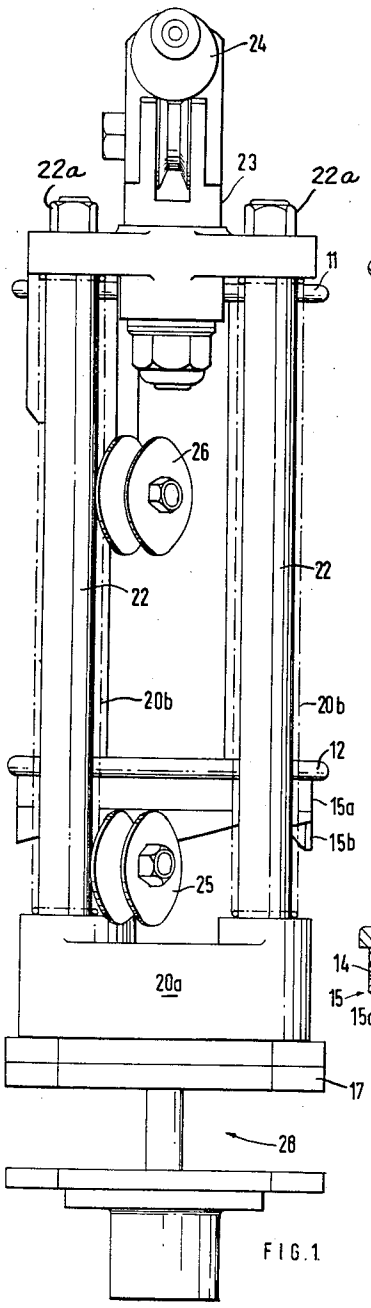



FIG. 1

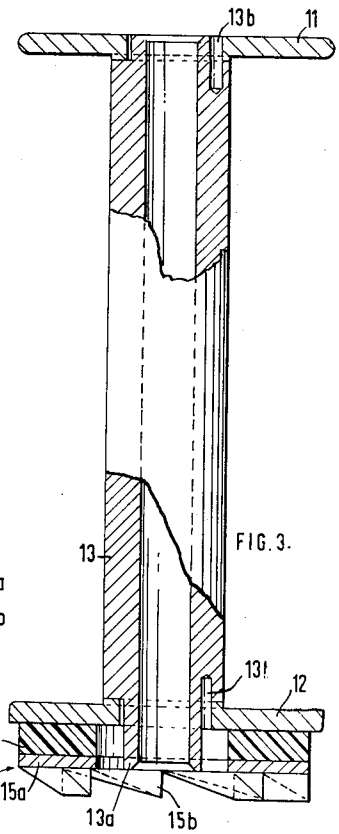



FIG. 3.

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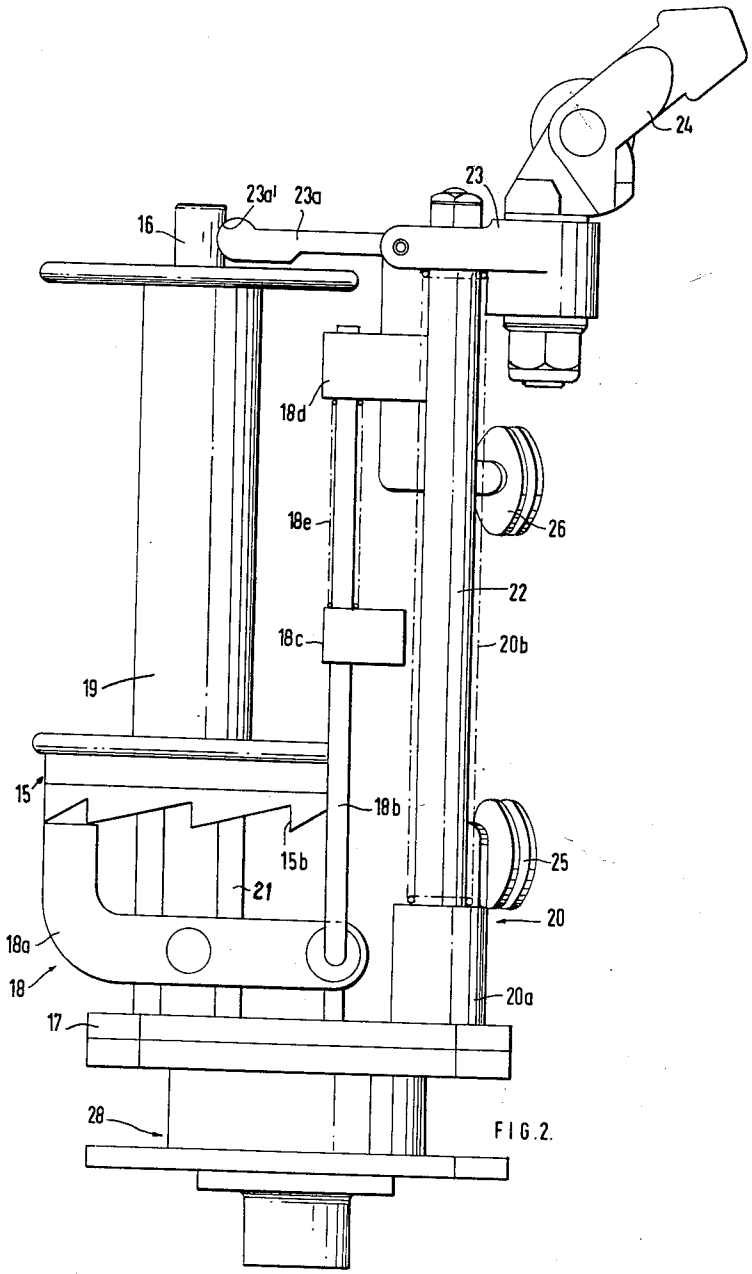



FIG. 2.

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United States Patent Office 3,107,576 Patented Oct. 22, 1963



3,107,576

# BRAIDING MACHINE BOBBIN AND CARRIER

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Filed Aug. 30, 1961, Ser. No. 135,078
9 Claims. (Cl. 87—22)

This invention concerns braiding machines and in particular, relates to an improved bobbin and also to a carrier therefor.

It is well known in the art to provide a bobbin carrier for a braiding machine which incorporates a ratchet let-off to control the rotation of a bobbin supported thereby or integral therewith, such let-off permitting intermittent rotation of a bobbin, thereby periodically to release material from the bobbin for braiding, and being controlled by the tension on the braiding material carried by the bobbin.

The operation of these conventional assemblies is such that, as the braiding material available at any one time is progressively used, the tension in the material still available increases to a maximum, whereupon a pawl is disengaged from the ratchet and a further length of material is released from the bobbin to become available for braiding. The tension falls as a result of the additional material released and the pawl moves back into engagement with the ratchet. In due course, an increase in tension will cause disengagement of the pawl and more material will be made available.

It has been found that, at high braiding tensions, excessive wear to the ratchet takes place and the extent of the wear is such that an alternative carrier assembly has been preferred.

In the alternative assembly, the bobbin axis has been directed in a plane transversely of the hose or like element being braided and, by virtue of the limited space available between carriers, the maximum radius of the bobbins has been maintained at a low figure, and thus the capacity thereof kept down. As a consequence of the low capacity, an appreciable amount of time is spent replenishing the machine with a corresponding reduction in the time available for actual production.

The present invention is predicated upon a realisation that by appropriately modifying the form of bobbin, a ratchet-type let-off motion may be used even under high braiding tensions and, thus the bobbin capacity, and therefore productivity, may be improved considerably.

According to the present invention, a braiding machine bobbin of the ratchet let-off type and comprising two spaced-apart flanges having a sleeve therebetween and a ratchet base associated with one of said flanges is characterised by a resilient connection between said one flange and said ratchet base.

Preferably, according to the present invention, said resilient connection comprises a rubber or like material disposed between said flange and said ratchet base and bonded, on one surface, to the flange and, on the other surface, to the base.

It has been found that, by using a bobbin constructed in accordance with the present invention, a higher capacity bobbin might be used for high tension braiding than has been possible heretofore. However, the application of a high tension by a conventional carrier for the type of bobbin to which the present invention relates necessitates the use of a compression spring of appreciable longitudinal extent if excessive lateral dimensions are to be avoided. But, a long spring might well become distorted in use and possibly be inefficient in operation.

It is a further object of the present invention to avoid this difficulty and to provide a carrier of such form as to allow the application of an appreciable braiding tension without excessive vertical carrier extent.



Thus, according to a further feature of the present invention, there is provided a bobbin carrier for use in combination with a bobbin of the kind before referred to which comprises a bobbin spindle, pivotally mounted pawl means, so disposed as to engage the ratchet base of a bobbin mounted on said spindle, and means for causing said pawl to pivot thereby to engage or be disengaged from said base as appropriate, said means including a sliding weight adapted to be displaced longitudinally of a plurality of support pillars and carrying a pulley around which braiding material passes, and resilient means against which said sliding weight is constrained to move, said resilient means comprising a helical compression spring disposed about each pillar and between said sliding weight and a fixed seating, said sliding weight being adapted to abut and displace a linkage operatively connected to the pawl means, thereby to control the position thereof.

The invention will now be described further, by way of example only, with reference to the accompanying drawings illustrating one particular embodiment thereof, and in which:

FIG. 1 is a part elevation of a bobbin carrier in accordance with the present invention;

FIG. 2 is a side elevation of the embodiment of FIG. 1 and

FIG. 3 is a cross-sectional view of the bobbin shown in FIGS. 1 and 2.

Referring now to the drawings, and in particular, to FIG. 3, a bobbin constructed in accordance with the present invention comprises two flanges **11**, **12** secured one to each end of a sleeve **13** by means of pins **13***b*. The lower end of the sleeve **13** to which the flange **12** is fitted has a reduced outer diameter portion **13***a* which extends through the flange.

To the outer face of the flange **12** is bonded an annular disc **14**, said disc **14** being resilient and of such material as rubber. To the remote face of the disc **14** is bonded a ratchet base **15**, said base comprising an annular disc **15***a* and ratchet teeth **15***b* depending from the underside of such disc adjacent the periphery thereof.

A braiding machine carrier to which the bobbin is to be applied is illustrated in FIGS. 1 and 2 and consists of a bobbin spindle **16** supported upon a base plate **17**, pivotally mounted pawl means **18**, so disposed relative to the spindle as to engage the ratchet base **15** of a bobbin **19** located thereon, and means **20** for causing said pawl means to pivot, thereby to engage or be disengaged from said ratchet base as appropriated.

The spindle **16** has a sleeve **21** about the lower part thereof, such sleeve locating the bobbin **19** axially of the spindle by providing a seating against which the lower extremity **13***a* of the sleeve **13** abuts.

The pawl means **18** consists of a double-sided release latch **18***a* pivotally attached to the sleeve **21**, the latch passing on both sides of such sleeve **21**, one end of said latch **18***a* being adapted to engage the ratchet teeth **15***b* and the other end adapted to receive the lower end of an actuating rod **18***b*. The end of the latch **18***a* arranged to engage the teeth **15***b* may, if preferred, be tipped to reduce wear thereto. Rigidly secured to the actuating rod **18***b* is an abutment member **18***c* and between said member **18***c* and a fixed locating lug **18***d* is disposed a helical compression spring **18***e*, the spring being located about the actuating rod.

The base plate **17** carries perpendicularly thereto two parallel spaced apart pillars **22**, said pillars being connected at their upper ends by a web **23**, the web **23** being adapted to receive a nozzle or guide attachment **24**.

The means **20** for causing the pawl means to execute pivotal motion comprises a block or weight **20***a* in sliding engagement with the pillars **22** and a helical compression

spring 20*b* about each of said pillars, the springs 20*b* being disposed between the upper surface of the block 20 and the underside of the web 23, the latter being fixed relative to the pillars by nuts 22*a*. To the sliding block 20*a* is secured a freely rotatable pulley 25 and to the locating lug 18*d* is secured a further pulley 26, said lug, in turn, being rigidly attached to the web 23. The pulleys 25, 26 are parallel and are so directed relative to the bobbin as to lie approximately tangential to the surface of a partly used bobbin.

The web also has pivotally secured thereto a support 23*a*, said support being directed radially of the spindle 16 and having a radial end portion 23*a'* to engage a complementary shaped detent in the spindle 16.

To the underside of the base plate 17 is secured a cam follower assembly 28 of known type adapted to engage a cam slot of a braiding machine in conventional manner, the said assembly 28 being tack welded to the base plate at intervals and thus being readily removable for replacement purposes.

In operation, a wire from the bobbin 19 passes over the fixed pulley 26, around the pulley 25 and through the guide attachment 24 to the cable being braided. As the carrier rotates about the cable, the tension in the wire will increase and the pulley 25 will be drawn axially of the pillars 22 against the action of the springs 20*b*. After displacement by a predetermined extent, the sliding block 20*a* contacts the abutment member 18*c* and, thus, displaces the actuating rod 18*b*, thereby disengaging the latch 18*a* from the ratchet teeth 15*b*. Such disengagement will allow the rotation of the bobbin 19 on the spindle 16 and, in turn, a reduction in wire tension. As a consequence of such reduction, the sliding block 20*a* moves downwardly under the action of the springs 20*b* and allows the actuating rod 18*b* to return to its initial position, thereby effecting re-engagement of the latch 18*a* with the ratchet teeth 15*b* and braking the bobbin's rotation. A further increase in tension will result in the release of a further length of wire.

It has been found that by means of such a carrier as is proposed, in combination with a bobbin as hereinbefore described, a ratchet-type let-off motion may be used for braiding under high tension. As a direct consequence of such use, a longer braiding period between reloading than hithertofore is possible.

Furthermore, by virtue of the resilient connection between the bobbin flange and the ratchet base, the actual noise of the machine during operation is less and the frequency of the wire breakage reduced.

Further advantages stem from the use of a double-sided release latch which provides a wider and more stable bearing surface at the latch support pin than is the case with conventional assemblies; from the simple attachment of the web relative to the support pillars which allows of the ready replacement of compression spring for pay-off tension adjustment; and from the intermittent joint between the base and the cam follower which facilitates removal and replacement of the follower after wear.

The invention is not restricted to the particular features of the embodiment hereinbefore described, since alternatives will readily present themselves to one skilled in the art. For example, the replacement of the resilient pad between the bobbin flange and the ratchet base by such as a compression spring disposed between lugs on adjacent faces of the flange and the ratchet base may well be used with equal advantage. Furthermore, it will be evident that the bobbin according to the present invention may be applied to conventional carriers where a ratchet type let-off is used.

I claim:

1. A braiding machine bobbin of the ratchet let-off type comprising two parallel spaced apart flanges, a sleeve disposed between said flanges and maintaining the said spaced disposition, a ratchet base associated with one of said flanges, and a resilient connection between said ratchet base and said one flange.



2. A braiding machine bobbin as claimed in claim 1 in which the said resilient connection comprises a pad of a resilient material secured on one surface to the said one flange, and, on the other surface to the ratchet base.

3. A braiding machine bobbin of the ratchet let-off type comprising two parallel spaced apart flanges, a sleeve disposed between said flanges and maintaining the said spaced disposition, a ratchet base associated with one of said flanges, and a rubber pad secured to the said one flange and to the ratchet base.

4. The combination with a braiding machine bobbin of the ratchet let-off type comprising two parallel spaced apart flanges, a sleeve disposed between said flanges and maintaining the said spaced disposition, a ratchet base associated with one of said flanges, a resilient connection between said ratchet base and said one flange, a carrier comprising a bobbin spindle, pivotally mounted pawl means disposed so as to engage the ratchet base of a bobbin mounted on the spindle, and actuator means adapted to cause the pawl means to pivot thereby to engage or become disengaged from the ratchet base as appropriate, the said actuator means including a plurality of support pillars, a sliding weight adapted to be moved longitudinally of said pillars, a pulley mounted upon said sliding weight, a helical compression spring disposed about each support pillar and abutting the said sliding weight, a fixed seating to receive the other end of each spring, and a linkage operatively connected with the pawl means and adapted to be abutted by the sliding weight and to be displaced thereby thus to control the position of the pawl means.

5. The combination as set forth in claim 4 wherein the said resilient connection between the bobbin flange and ratchet base comprises a rubber pad secured to the said one flange and to the ratchet base.

6. A braiding machine bobbin and carrier combination of the ratchet let-off type comprising two parallel spaced apart flanges, a sleeve disposed therebetween and maintaining said spacing, a ratchet base associated with one of said flanges, a resilient connection between said ratchet base and said one flange, said carrier comprising a bobbin spindle, a pawl pivotally mounted on a second sleeve and engaging said ratchet base, actuator means causing said pawl to move into and out of engagement with said ratchet base, said actuator means being controlled by variations in tension on a filament being unwound.

7. A braiding machine bobbin and carrier combination according to claim 6 wherein said actuator means is controlled by a weight slideably mounted on at least one support pillar, a pulley slideable with said weight, and a linkage operatively connected with said pawl adapted to be displaced by said weight, said pulley being actuated by tension on said filament.

8. A combination according to claim 7 including a fixed seat on said pillar, an abutment member on said linkage and adapted to be contacted by said weight, said abutment member being between said weight and said seat, and a helical spring on said pillar between said weight and a web.

9. A combination according to claim 8 wherein there is provided a stationary pulley on said seat, said filament passing over said slideable pulley and said stationary pulley whereby increases in tension cause said slideable pulley to move toward said stationary pulley and decreases in tension permit said slideable pulley to move away from said stationary pulley.

**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 1,517,840 | Koella | Dec. 2, 1924 |
| 2,489,006 | Bunch | Nov. 22, 1949 |
| 2,506,772 | Bunch | May 9, 1950 |
| 2,897,716 | Olson | Aug. 4, 1959 |
| 2,911,875 | Ostermann et al. | Nov. 10, 1959 |
| 2,933,971 | Silver et al. | Apr. 26, 1960 |