Sept. 14, 1937. M. J. McHALE 2,093,135

FLYER CONSTRUCTION

Filed May 28, 1937

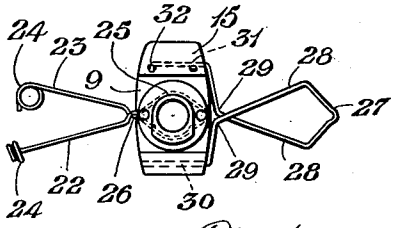


Fig. 1.

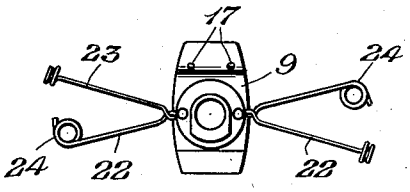


Fig. 4.

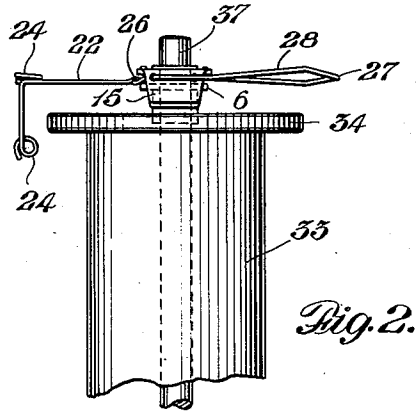


Fig. 2.

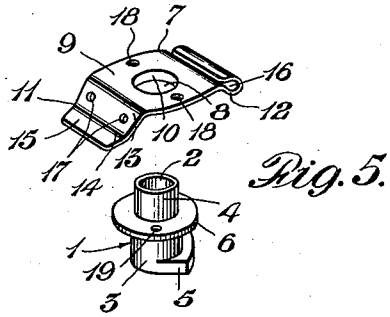


Fig. 5.

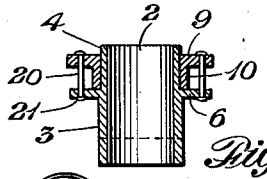


Fig. 6.

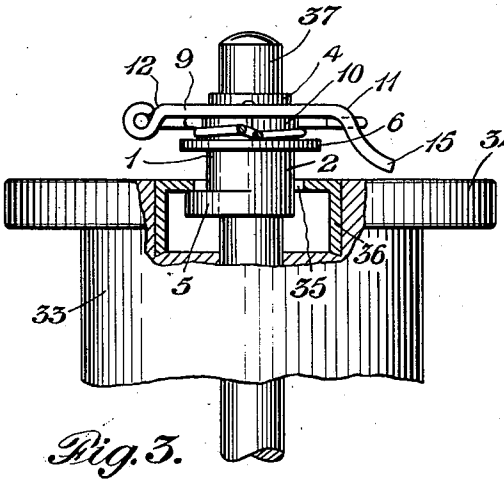


Fig. 3.

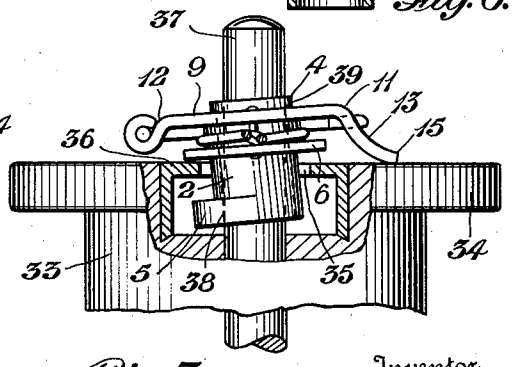


Fig. 7.

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By

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FLYER CONSTRUCTION

Michael J. McHale, Scranton, Pa.

Application May 28, 1937, Serial No. 145,343

16 Claims. (Cl. 117—26.5)

My invention relates to flyers of the type used with spinning machines and the like and more particularly to a flyer block having an improved balance and brake arrangement.

The purpose of the present invention is to prevent kinks from forming in the silk as it is taken off the lower bobbin and wound on the upper one, thus eliminating the necessity of cutting and tying the ends of the threads. This is accomplished by providing the flyer block with a brake member, adapted to frictionally engage with the head of the bobin and spindle whereby the flyer rotates with the bobbin when the winding machine is slowed down and just before rotation of the bobbin is stopped.

Heretofore it has been proposed to provide flyers having means to prevent kinks from forming in the thread when the winding machine stops, comprising a brake or other device for arresting rotative movement of the flyer with respect to the take-off bobbin. In Patent 1,962,693 dated June 12, 1934, I have disclosed an anti-kink construction wherein the foot member on the flyer is adapted to frictionally engage with a recess in the bobbin head whereby the flyer block and bobbin rotate as a unit during the final interval of their rotation. It has also been proposed to equip flyer blocks with a brake mechanism, pivotally attached to the flyer block, the brake member being urged into contact with the head of the bobbin by spring means and released during normal operation due to centrifugal force. In the prior art devices wherein a pivotally mounted brake is used, it frequently happens that the spring or other means used to urge the brake into contact with the head of the bobbin loses its tension with the result that the brake merely drags on the bobbin. Since the braking effect is a function of the tension of the spring, reduced pressure lowers the brake efficiency. The present invention, is designed to overcome deficiencies of the prior art arrangements and is an improvement on the structure disclosed in my above referred to patent.

An object of my invention is to provide an improved flyer block construction adapted to prevent kinks from forming in the thread when the winding machine stops.

Another object of my invention is to provide an improved brake device for flyers whereby rotative movement of the flyer with respect to the bobbin is arrested at a predetermined interval of rotation of the block.

Yet another object of my invention is to provide a flyer having a brake device which is an integral part or element of the flyer block.

A further object of my invention is to provide an improved flyer block balance and brake device for flyers adapted to afford a constant and substantially perfect balance for the block.

A still further object of my invention is to provide an improved flyer block balance, a brake associated therewith and a flyer wire balance.

Still another object of my invention is to provide an improved flyer brake device, constructed and arranged whereby maximum braking effect is obtained through the medium of frictional engagement of the block with the spindle and head of the bobbin.

With these and other objects in view, which may be incident to my improvements, the invention consists in the parts and combinations to be hereinafter set forth and claimed, with the understanding that the several necessary elements, comprising my invention, may be varied in construction, proportions and arrangement, without departing from the spirit and scope of the appended claims.

In order to make my invention more clearly understood, I have shown in the accompanying drawing means for carrying the same into practical effect, without limiting the improvements in their useful applications to the particular constructions, which for the purpose of explanation, have been made the subject of illustration.

In the drawing:

Figure 1 is a plan view of my improved flyer having a flyer block balance, a brake and flyer wire balance.

Fig. 2 is an elevational view showing the flyer block of Figure 1 in operative position on a spindle.

Fig. 3 is an elevational view, partly in section, showing the flyer block in the operative position on a spindle, the brake member being out of contact with the head of the bobbin.

Fig. 4 is a plan view showing my improved flyer block used with double arm flyer wires.

Fig. 5 is an expanded perspective view of the block showing the top and bottom portions thereof.

Fig. 6 is a sectional view along line 6—6 of Fig. 4; and

Fig. 7 is an elevational view, partly in section, showing the flyer block in the operative position on a spindle, the brake member being in contact with the head of the bobbin.

Referring to the drawing and more particularly to Figures 1 and 5 there is shown a flyer block arrangement comprising a body member 1 having a spindle receiving opening 2, a base portion 3 and head portion 4. The base is formed

with an eccentric foot 5 adapted for insertion into the head of a bobbin and intermediate of the base and head portions there is provided a peripheral flange 6, the upper or top portion of the flyer block is in the form of a cap designated generally by numeral 7, provided with an opening 8 in the body portion 9 thereof, the opening being concentric with the spindle receiving opening 2 in the base of the block. On the under side of the cap and coextensive with the periphery of the opening 8 is a sleeve 10 adapted to seat or rest upon flange 6 when the body and cap portions of the block are in the assembled position, as more clearly shown in Fig. 6.

The body portion 9 of the cap member 7 is formed with extensions 11 and 12 on opposite sides thereof, the extensions constituting the flyer block brake and balance respectively. Extension 11 which forms the brake member is bent downwardly as at 13 and outwardly along line 14, providing a lip portion 15 adapted for frictional engagement with the head of a bobbin, and extension 12 is folded back upon itself to provide a recess or slot 16 adapted to receive one of the arms of a flyer wire balance, lip portion 15 of the brake member being provided with openings 17 to receive the end of the other arm of the balance, as will be described more fully hereinafter. In order to maintain the cap and body portion of the flyer block in assembled position, the body of the cap and peripheral flange 6 are formed with openings 18 and 19 respectively, and through which pin or rivet members 20 are inserted. The pins may be threaded into flange 6 or the ends 21 thereof turned over by riveting.

Referring to Figures 1 and 2, the flyer block is shown in the assembled position and equipped with a flyer wire and flyer wire balance. The wire is formed with arms 22 and 23, having suitable eyelets 24 at the ends thereof and a central block engaging section 25, adapted to seat in the peripheral groove formed between body portion 9 of the cap and flange 6 on the base of the flyer block. The flyer wire is mounted in the operative position on the block by twisting or turning the arms 22 and 23 as at 26. It will be noted that the central block engaging section of the wire is bent around pins 20 and is in tight engagement with the exterior surface of sleeve 10 formed on the cap member. The pins or rivets 20 perform a double function; they maintain the parts of the flyer block, that is the cap and base portions, in the assembled position and they further provide anchoring or stop means whereby the flyer wire or wires are prevented from becoming displaced by rotative movement with respect to the block during normal operation.

As explained in connection with the description of the parts shown in Fig. 5, the cap member is in the form of a combination brake and flyer block balance. It will be appreciated that in use with an eccentric foot type of flyer block, that the weight of the offset foot must be compensated for or neutralized, otherwise the block will be unbalanced. In the present arrangement, the amount or quantity of material used in forming extension member 12 is definitely related to the quantity of material and location of the eccentric foot so that the excess material comprising the foot member on one side of the block, is balanced by the extension member. In other words after the cap and base portions of the block are in the assembled position, the weight of the portions of the block along a line medially thereof through springs 18 will be substantially equal, thus providing a perfectly balanced flyer block.

In order to balance the flyer wire arrangement shown in Figures 1 and 2, there is provided a balancing device comprising a loop member having a base portion 27, crossed arms 28, which are offset as at 29 and provided with extensions 30 and 31. Extension 30 is adapted to seat in slot 16 of the cap member and inturned projecting end 32 of extension 31 seats in one of the openings 17 formed from wire of sufficient tension to maintain its preformed crossed arm configuration, whereby end 32 of extension 31 is urged into and maintained in the seated position in one of the openings 17 during operation. It will be noted that the construction and arrangement of the combined flyer brake and balance, permits mounting the wire on either side of the block, that is, the arms of the flyer wire may extend to the right or left and similarly the wire balancing loop can be mounted at either side of the block, by reason of the provision of the symmetrically spaced openings 17 in the horizontal lip 15 of the brake member.

Referring to Fig. 4, the flyer block is shown as used with double arm flyer wires. In this arrangement the flyer wire balancing loop is omitted, for the reason that the symmetrical arrangement of the double wires is such that the arms at one side of the block balance the arms on the other side. It will be noted that the flyer block structure is the same as shown in Figure 1, and that the block is balanced even though the loop has been removed, since openings 17 are symmetrically spaced and compensate for the material which has been displaced from the extension to accommodate end 32 formed on arm 31 of the loop.

Referring to Figs. 3 and 7, the flyer block is shown in the position it assumes during the winding operation and when the brake is applied. Bobbin 33 may be of conventional type having a head 34 formed with a spindle opening 35 in bobbin head flange 36, through which spindle 37 projects. As the thread is unwound from the lower bobbin and carried to the upper bobbin on a winding machine, the flyer block is rotated around spindle 37 and at the same time the block is raised upwardly on the spindle so that foot member 5 contacts with ferrule 36 which prevents the block from moving away from the bobbin. When the winding machine slows down and just before rotation of the bobbins is stopped, the flyer block drops down due to gravity, to the position shown in Fig. 7.

It is particularly noted that when the block is in its lowermost position, as shown in Fig. 7, that braking is effected by means of three points of bearing between the block, spindle and bobbin head. When the block drops down on the spindle, lip 15 contacts with the bobbin head 34 and frictionally engages therewith. At the same time, the block is tilted with respect to the spindle so that an appreciable frictional bearing contact is obtained at point 38, in the vicinity of the base of the block and at 39 at the top thereof. It will be understood that the diameter of the spindle receiving opening is designed to permit sufficient play, whereby frictional contact between the spindle and block can be obtained, so that the braking action of the lip 15 can be supplemented and maximum braking action obtained.

By means of my improved flyer block, provided with a flyer block balance and brake arrangement, when the winding machine has stopped,

additional thread is not withdrawn from the lower bobbin, for the reason that during the last stage of revolution of the bobbin, the flyer block has been rotating with it. Since the bobbins are stopped at substantially the same time and the flyer block is at rest with respect to the lower bobbin, all of the thread which has been withdrawn is wound on the upper bobbin, before the winding machine has come to rest, and hence kinks are not formed in the silk.

While I have shown and described the preferred embodiment of my invention, I wish it to be understood that I do not confine myself to the precise details of construction herein set forth, by way of illustrations as it is apparent that many changes and variations may be made therein, by those skilled in the art, without departing from the spirit of the invention, or exceeding the scope of the appended claims.

What I claim is:

1. In a flyer for spinning machines, a centrally apertured body member having base and head portions, a combined flyer block balance and brake comprising a cap member mounted upon the head portion of said flyer body, said cap being formed with an extension adapted for frictional engagement with the head of a bobbin whereby the flyer and bobbin rotate as a unit during the final interval of their rotation.

2. In a flyer for spinning machines, a centrally apertured body member having base and head portions, a peripheral flange formed on the body portion between the base and head portions, a combined flyer block balance and brake comprising a cap member mounted upon the head portion of said flyer body, the cap forming with the peripheral flange a flyer wire receiving groove, said cap being formed with an extension adapted for frictional engagement with the head of a bobbin whereby the flyer and bobbin rotate as a unit during the final interval of their rotation.

3. A flyer for spinning machines, comprising a centrally apertured body member having a head portion formed thereon, a foot member on said body adapted for insertion into the head of a bobbin and a combined flyer block balance and brake comprising a cap member attached to the head portion of the flyer body, said cap being formed with an extension adapted for frictional engagement with the head of a bobbin whereby the flyer and bobbin rotate as a unit during the final interval of their rotation.

4. A flyer for spinning machines, comprising a centrally apertured body member having a head portion formed thereon, a foot member on said body adapted for insertion into the head of a bobbin, a peripheral flange on said body portion between the foot and head portions, and a combined flyer block balance and brake comprising a cap member attached to the head portion of the flyer body, the cap forming with the peripheral flange a flyer wire receiving groove, said cap being formed with an extension adapted for frictional engagement with the head of a bobbin whereby the flyer and bobbin rotate as a unit during the final interval of their rotation.

5. In a flyer for spinning machines, a centrally apertured body member having a base and a head portion, a combined flyer block balance and brake comprising a cap member mounted upon the head portion of the flyer body, said cap having a body portion formed with extensions on opposite sides thereof, one of said extensions being adapted for frictional engagement with the head of a bobbin whereby the flyer and bobbin rotate as a unit during the final interval of their rotation.

6. In a flyer for spinning machines, a centrally apertured body member having a base and a head portion, a peripheral flange on said body portion between the foot and head portions, a combined flyer block balance and brake comprising a cap member mounted upon the head portion of the flyer body, the cap forming with the peripheral flange a flyer wire receiving groove, said cap having a body portion formed with extensions formed on the opposite side thereof one of said extensions being adapted for frictional engagement with the head of a bobbin whereby the flyer and bobbin rotate as a unit during the final interval of their rotation.

7. A flyer for spinning machines, comprising a centrally apertured body member having a head portion formed thereon, a foot member on said body adapted for insertion into the head of a bobbin and a combined flyer block balance and brake comprising a cap member attached to the head of the flyer body, said cap having a body portion formed with extensions on opposite sides thereof, one of said extensions being adapted for frictional engagement with the head of a bobbin whereby the flyer and bobbin rotate as a unit during the final interval of their rotation.

8. A flyer for spinning machines, comprising a centrally apertured body member having a head portion formed thereon, a foot member on said body adapted for insertion into the head of a bobbin, a peripheral flange on said body portion between the foot and head portions and a combined flyer block balance and brake comprising a cap member attached to the head portion of the flyer body, the cap forming with the peripheral flange a flyer wire receiving groove, said cap having a body portion formed with extensions on opposite sides thereof, one of said extensions being adapted for frictional engagement with the head of a bobbin whereby the flyer and bobbin rotate as a unit during the final interval of their rotation.

9. In a flyer for spinning machines, a centrally apertured body member having a base and a head portion, a peripheral flange on said body between the base and head portions, a combined flyer block balance and brake comprising a cap member mounted upon the head portion of the flyer body, said cap having a body portion formed with extensions on opposite sides thereof and an opening concentric with the opening in the flyer body, a downwardly extending sleeve attached to the periphery of the opening in the body of the cap member adapted to seat on the peripheral flange of the flyer body, the cap member and peripheral flange forming a flyer wire receiving groove, one of the extensions on the body portion of the cap being adapted for frictional engagement with the head of a bobbin whereby the flyer and bobbin rotate as a unit during the final interval of their rotation.

10. In a flyer for spinning machines, a centrally apertured body member having a base and a head portion, a peripheral flange on said body between the base and head portions, a combined flyer block balance and brake comprising a cap member mounted upon the head portion of the flyer body, said cap having a body portion formed with extensions on opposite sides thereof and an opening concentric with the opening in the flyer body, a downwardly extending sleeve attached to the periphery of the opening in the body of the cap member adapted to seat on the peripheral flange of the flyer body, means to maintain the cap in

seated engagement with said flange comprising pins insertable through the body portion of the cap and at diametrically opposite points of the flange, the cap member and peripheral flange forming a flyer wire receiving groove, one of the extensions on the body portion of the cap being adapted for frictional engagement with the head of a bobbin whereby the flyer and bobbin rotate as a unit during the final interval of their rotation.

11. In a flyer for spinning machines, a centrally apertured body member having a base and a head portion, a peripheral flange on said body between the base and head portions, a combined flyer block balance and brake comprising a cap member mounted upon the head portion of the flyer body, said cap having a body portion formed with extensions on opposite sides thereof and an opening concentric with the opening in the flyer body, one of said extensions being turned back upon itself and forming a balance for the flyer block, the other of said extensions being adapted for frictional engagement with the head of a bobbin whereby the flyer and bobbin rotate as a unit during the final interval of their rotation.

12. A flyer for spinning machines, comprising a centrally apertured body member having a head portion formed thereon, an offset foot member on said body adapted for insertion into the head of a bobbin and a combined flyer block balance and brake comprising a cap member attached to the head portion of the flyer, said cap having a body portion formed with extensions on opposite sides thereof, one of said extensions being turned back upon itself and forming a balance for the offset foot, the other of said extensions being adapted for frictional engagement with the head of a bobbin whereby the flyer and bobbin rotate as a unit during the final interval of their rotation.

13. A flyer for spinning machines, a centrally apertured body member having a base and a head portion, a peripheral flange formed on the body of the block between the base and head portions, a combined flyer block balance and brake comprising a cap member mounted upon the head portion of the flyer body, said cap having a body portion provided with extensions on opposite sides thereof and forming with the peripheral flange a flyer wire receiving groove, one of said extensions forming a balance for the flyer block and the other of said extensions being adapted for frictional engagement with the head of a bobbin whereby the flyer and bobbin rotate as a unit during the final interval of their rotation, a flyer wire in the wire receiving groove having its arms extending outwardly on the same side of the block and means to balance the flyer wire comprising a loop member attached to the extensions formed on the cap.

14. A flyer for spinning machines comprising a centrally apertured body member having a base and a head portion, a foot member on said body adapted for insertion into the head of a bobbin, a peripheral flange formed on the body of the block between the foot member and head portion, a combined flyer block and brake comprising a cap member attached to the head portion of the flyer body, said cap having a body portion provided with extensions on opposite sides thereof and forming with the peripheral flange a flyer wire receiving groove, one of said extensions forming a balance for the flyer block and the other of said extensions being adapted for frictional engagement with the head of a bobbin whereby the flyer and bobbin rotate as a unit during the final interval of their rotation, a flyer wire in the wire receiving groove having its arms extending outwardly on the same side of the block and means to balance the flyer wire comprising a loop member attached to the extensions formed on the cap.

15. In a flyer for spinning machines, a centrally apertured body member having a base and a head portion, a peripheral flange formed on the body of the block between the base and head portions, a combined flyer block balance and brake comprising a cap member mounted upon the head portion of the flyer body, said cap having a body portion provided with extensions on opposite sides thereof and forming with the peripheral flange a flyer wire receiving groove, one of said extensions forming a balance for the flyer block and being turned back upon itself to provide a slot between the folded portions, the other of said extensions being formed with a downwardly projecting portion having an opening therein, said projection being adapted for frictional engagement with the head of a bobbin whereby the flyer and bobbin rotate as a unit during the final interval of their rotation, a flyer wire in the wire receiving groove having its arms extending outwardly on the same side of the block and means to balance the flyer wire comprising a loop member having two arms, a portion of one of the arms being seated in the slot formed on the cap and the end of the other arm being seated in the opening in the cap projection forming the brake member.

16. A flyer for spinning machines, comprising a centrally apertured body member having a base and a head portion formed thereon, an eccentric foot member on said body adapted for insertion into the head of a bobbin, a peripheral flange formed on the body of the block between the eccentric foot and head portion, a cap member mounted upon the head portion of the flyer body, said cap having a body portion provided with extensions on opposite sides thereof and forming with the peripheral flange a flyer wire receiving groove, one of said extensions forming a balance for the flyer block and being turned back upon itself to provide a slot between the folded portions, the other of said extensions being formed with a downwardly projecting portion having an opening therein, said projection being adapted for frictional engagement with the head of a bobbin whereby the flyer and bobbin rotate as a unit during the final interval of their rotation, a flyer wire in the wire receiving groove having its arms extending outwardly on the same side of the block and means to balance the flyer wire comprising a loop member having two arms, a portion of one of the arms being seated in the slot formed on the cap and the end of the other arm being seated in the opening in the cap projection forming the brake member.

MICHAEL J. McHALE.