

April 11, 1939.

H. J. McDERMOTT

2,154,343

CAKE SWIFT

Filed May 28, 1937

4 Sheets-Sheet 1

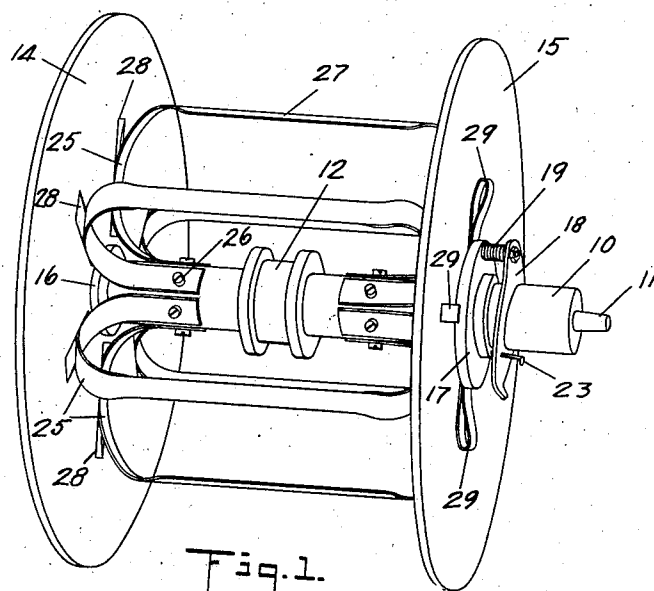


Fig. 1.

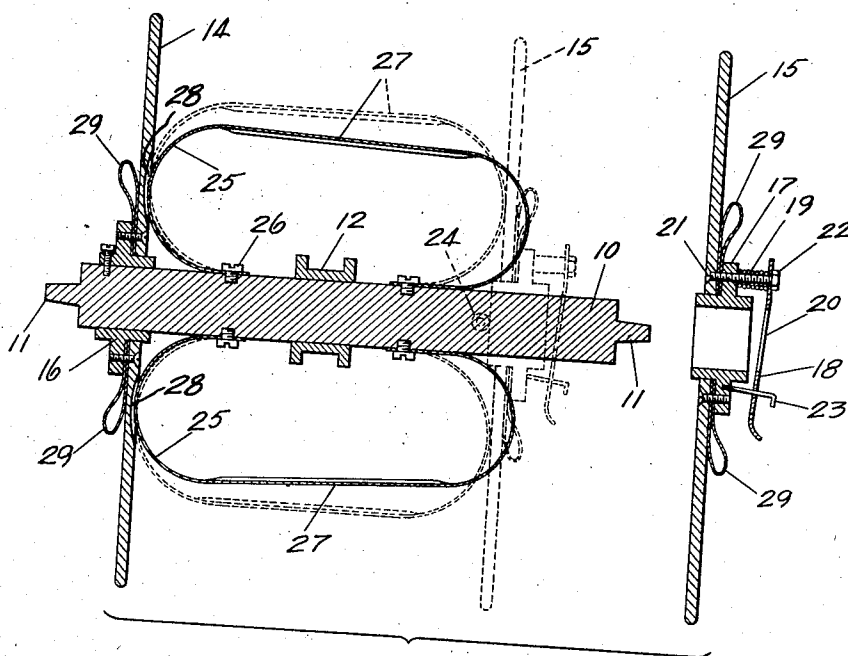


Fig. 2.

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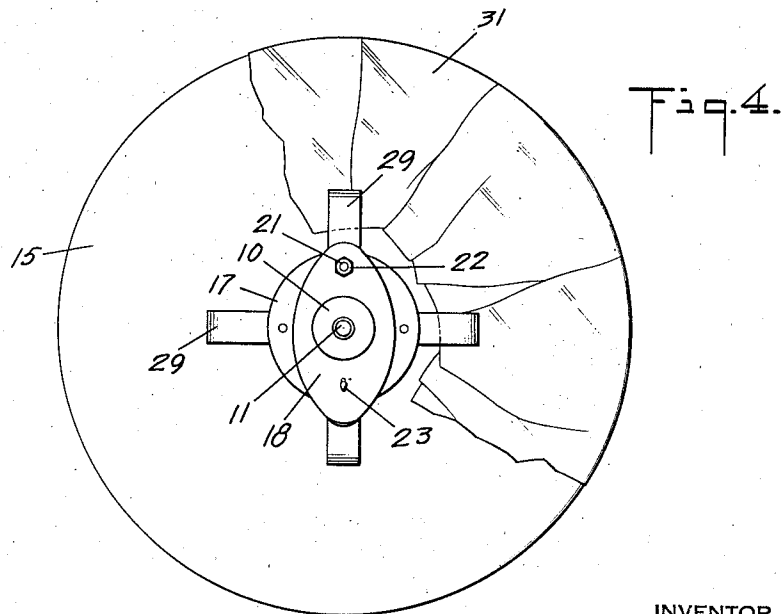
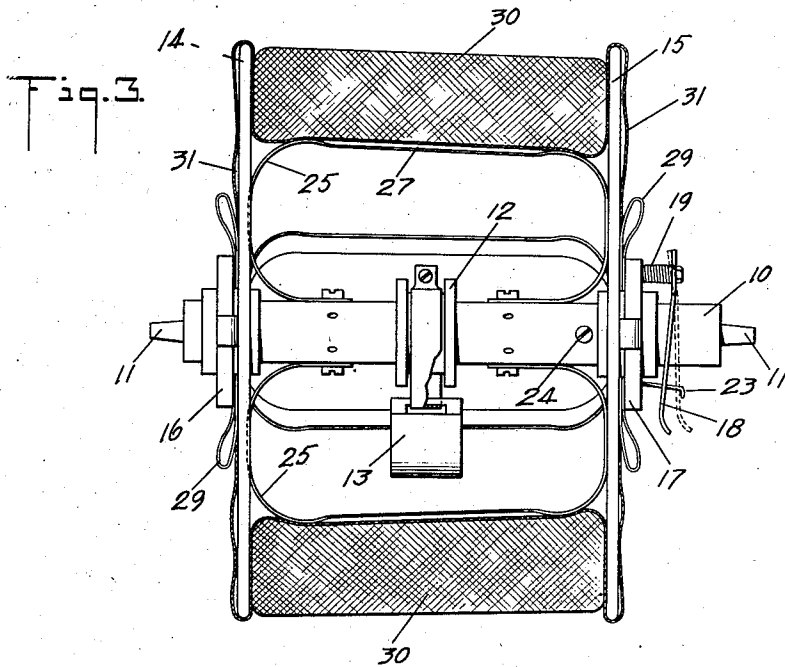
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4 Sheets-Sheet 2



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4 Sheets-Sheet 3

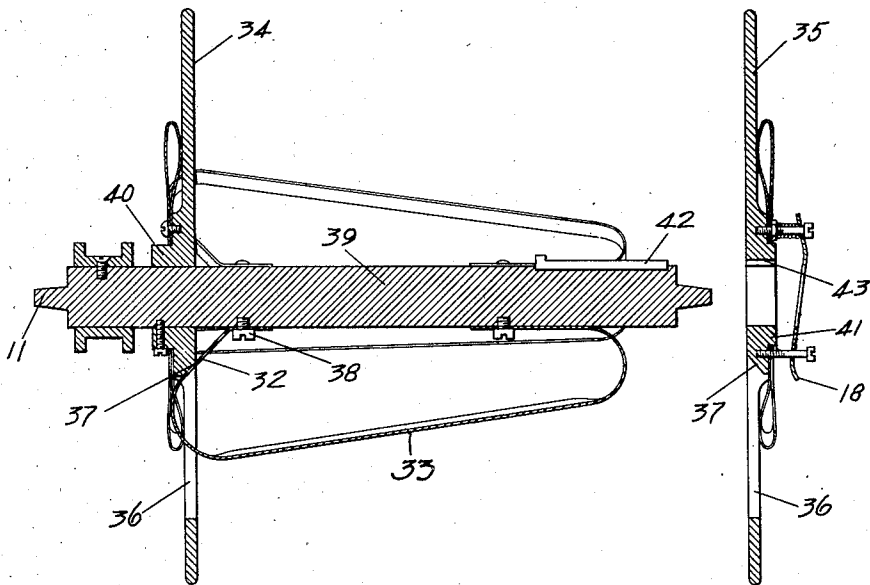


Fig. 5.

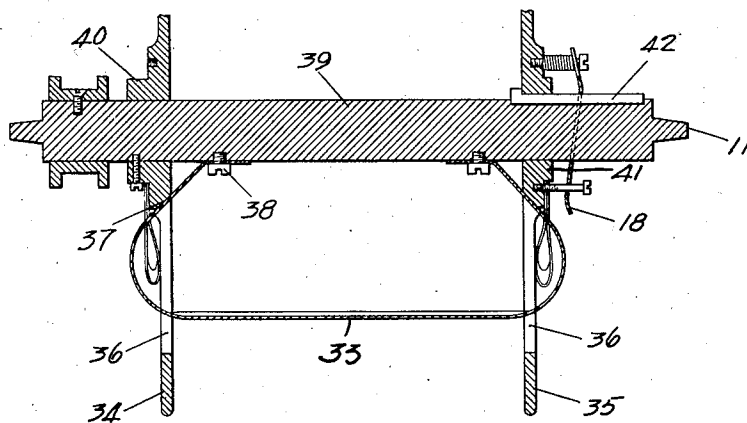


Fig. 6.

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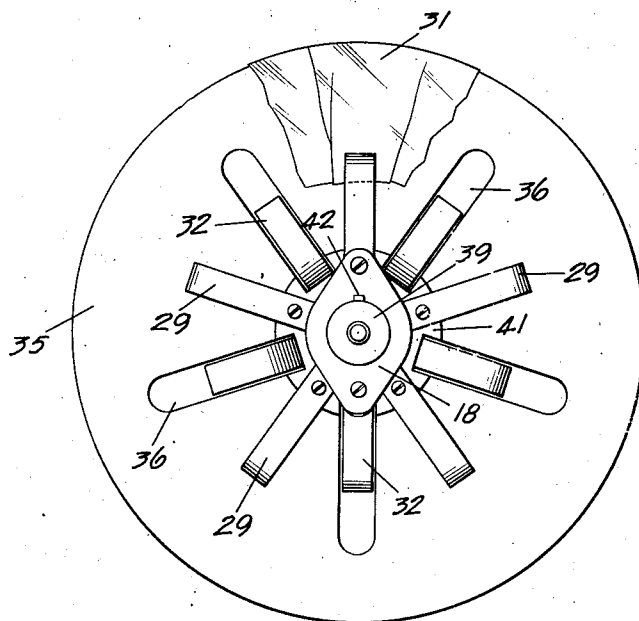
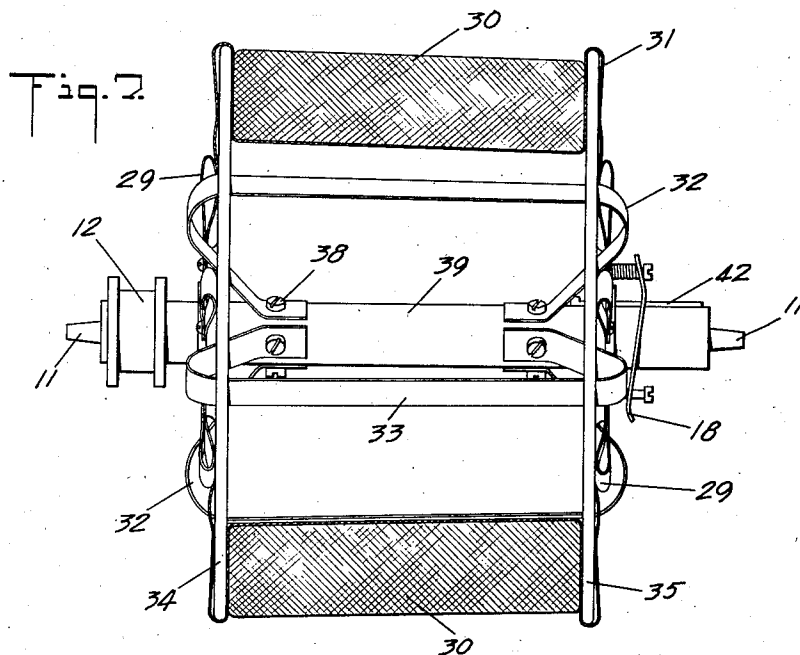
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CAKE SWIFT

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4 Sheets-Sheet 4



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2,154,343

CAKE SWIFT

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Application May 28, 1937, Serial No. 145,347

19 Claims. (Cl. 242—110)

This invention relates to a swift for holding a yarn cake, and more particularly a swift on which a processed cake of rayon yarn can be mounted when reeling the yarn onto a spool of a winding machine. The ordinary cake of rayon yarn is hollow and is also somewhat tapered. It is difficult to provide a collapsible swift which will hold the cake in an efficient manner. The object of the invention is to provide a simple and efficient construction for this purpose. It is characteristic of the invention that the periphery of the swift is formed by a plurality of resilient metal bands and that this periphery is expanded and contracted radially by movement of the heads toward or away from each other.

In the drawings,

Fig. 1 is a perspective view of one form of swift embodying my invention;

Fig. 2 is a vertical view in section taken on the line of the barrel of the swift of Fig. 1, one head being shown removed and in its assembled position in dotted lines;

Fig. 3 is a side view of the swift of Fig. 1 with a cake and cover thereon cut away to show the construction of the swift more clearly;

Fig. 4 is an end view of the swift of Figs. 1, 2 and 3, showing how the wrapping of the cake is held on the outside of the head;

Fig. 5 is a disassembled view of the preferred embodiment of my invention, showing one head removed preparatory to placing of a yarn cake on the swift;

Fig. 6 is a view in vertical section along the line of the barrel, of the lower part of Fig. 5, with the removable head in its operative position;

Fig. 7 is a side view of the preferred form of swift with a cake and cover thereon, the cake being cut away to show the construction of the swift more clearly; while

Fig. 8 is an end view of the swift of Figs. 6 and 7, showing how the wrapping of the cake is held on the outer side of the head.

In the manufacture of rayon yarn, when the yarn is first spun into the form of a cake, the yarn is either immediately reeled into the form of skeins or is enclosed in a cloth cover, processed and then wound onto a spool, bobbin or cone. If processed in cake form, it is important that the cake be mounted on a revoluble swift when the yarn is ready to be transferred to a spool or bobbin. Revoluble swifts heretofore known have not been entirely satisfactory to hold cakes that have been processed, and particularly when the yarn has not only been processed but dried while still in the form of a cake. The novel cake swift about

to be described operates in a highly satisfactory manner for the transferring of yarn from cakes.

I will first describe the construction illustrated in Figs. 1 to 4 of the drawings. The swift has a solid or tubular barrel or axle 10 which may be made of steel or stainless steel or any non-corrosive material. If desired, this barrel can be protected with acid-resisting paint. The barrel can have any desired pins 11 in its ends to permit mounting of the swift when the yarn is to be transferred to a spool. There may be a flanged spool 12 on the middle of this barrel, if desired, for the purpose of suspending a weight to obtain greater tension on the yarn as it is wound off the swift. The flanges on the spool 12 will serve to keep the weight 13 centered on the spool.

The swift has two flanges or heads 14, 15 of which one is shown fixed on the barrel and the other removable. The fixed head 14 is screwed to a metal collar 16 which in turn is screwed to the barrel 10. The two heads may be made of compositions such as phenolic condensation products or any other suitable material. The removable head 15 has a somewhat similar collar 17 on which it is mounted, and this collar 17 carries locking means adapted to hold the head without sliding on the barrel until the lock is manually released.

Any usual type of wedge lock may be employed, and the one shown is merely illustrative of the principle. It consists primarily of a locking plate 18 and a compression spring 19. There is an opening 20 through the locking plate adapted to receive the barrel 10. The opening 20 is slightly larger in diameter than the barrel. The plate is mounted on a long screw 21 coming through from the inner face of the head 15 through a flange on the collar 17, and the plate is held spaced from the collar 17 by the compression spring 19. The spring serves to keep the plate away from the collar by pressing it flat against the nut 22 on the end of the screw 21. The plate has a certain amount of play on the screw 21. This pivot point of the locking plate is near one end of the plate and spaced some distance from the barrel. The plate also is slightly bent so that when the portion of the plate under the nut 22 lies flush against the nut, the portion of the plate surrounding the barrel 10 is not at right angles to the barrel and is gripping it. In this normal position of the locking plate, therefore, the head is locked on the barrel.

To limit the movement of the locking plate 18 to a right angle position, there is a small pin 23 projecting outwardly from the collar 17 on the

side opposite from the screw 21, which passes through a small hole in the locking plate. When it is desired to release the head from the barrel, the free end of the locking plate, i. e., the end opposite to the one mounted on screw 21, is pulled away from the head 13, thereby bringing the opening 20 at right angles to the barrel 10 and releasing the head so that it can slide on the barrel.

10 The body or periphery of the swift is formed in a novel manner. While the periphery of a non-collapsible swift is ordinarily in the form of a cylinder having a solid surface, the present construction has an expansible periphery consisting of a plurality of metal strips having certain characteristics as to resiliency. The strips are bent or bowed in the form of loops running across the swift, that is to say, in planes containing the barrel 10 and radiating therefrom at uniformly spaced angles around the barrel. In the two embodiments of the invention shown in the drawings, the elements constituting the periphery are flat bands of resilient metal having substantial width, being bowed up into the form of a loop with the ends secured to the barrel by screws 26. These ends are made into return bends so that they lie flat on the surface of the barrel, but it will be obvious that if desired the ends can be inserted radially into the barrel and held in that position. By bowing the bands of Figs. 1 to 4 as just described, resilient sides 25 facing towards the two heads 14, 15 are provided. The outer portions 27 of the bands together form the periphery of the swift and are preferably, though not necessarily, formed in a manner which keeps them straight and substantially rigid. To maintain this straight character, these portions 27 are curved in a cross-section which is convex when viewed from the outside. If desired, the outer portions could be made of material which is not resilient. Notches 23 can be cut on the inner faces of the heads 14, 15 to assist in keeping the loops in their proper radial positions.

The effect on these spring bands of the removal and replacement of one of the heads is shown very clearly in Fig. 2. The dotted line position of the bowed bands in this figure is the position which they assume when the removable head 15 is in its operative position and the bands are squeezed laterally to increase the periphery of the swift. When the removable head 15 is taken off, the end portions 25 of the bands which were in contact with the removable head 15 expand outwardly to the solid line position, thus pulling the outer portions 27 radially inward. It will be noted that while the lateral expansion of the end portions 25 adjacent the removable head causes reduction in diameter of the periphery at both sides of the swift, the contraction of the end of the periphery adjacent the fixed head 14 and the consequent slight lateral movement of the outer portion 27 do not result in the same reduction in diameter of the periphery. This is due to the lateral pressure of the fixed head 14 against the adjacent end portions 25 of the bands. The periphery of the swift therefore assumes a cone shape when the head 15 is removed. This is particularly suitable for receiving the ordinary rayon yarn cake because the latter has a slight taper to it. After the cake has been slid over the periphery of the swift, the head 15 can be pushed back onto the barrel and expansion of the periphery caused by pressure of the head 15 and the end portions 25 adjacent it. The head 15 can be pushed inwardly until the desired amount of in-

crease in diameter and reduction in taper of the periphery have been obtained. To avoid the possibility of expanding the metal bands beyond their resilient limits, a set screw 24 is located at the proper point on the swift barrel (Figs. 2 and 3). While in Fig. 2 the operative position of the spring bands does not indicate any taper, it will be obvious that the parts can be adjusted to keep a slight taper, if that is desired.

Assuming that a processed yarn cake 30, while still surrounded by a cloth cover 31 to protect it, has been placed on the swift and the removable head 15 has been pushed into its operative position, the trigger or locking plate will hold the head 15 in position. The cover or cloth is then unwound from the face of the cake and each side is turned back over the adjacent head and passed underneath small metal clips 29, as shown in Figs. 3 and 4. These clips are loops of resilient metal held between the heads 14 and 15 and the flanges on their collars 16 and 17, as can be seen in Figs. 1 to 4. The parts are now in the position shown in Fig. 3, with the cake resting against the outer portion 27 forming the periphery. It will be observed that because of the pressure of the heads these bands have expanded against the inner side of the cake so as to permit removal of all the yarn without collapse of the cake toward the end of the operation. Also the lateral pressure of the heads 14 and 15 has so compressed and hardened the cake as to cause it to resist the natural tendency of the yarn to channel inwards due to the pull of the spool.

As shown in Fig. 3, a weight 13 suspended on the spool 12 on the barrel by means of a yoke can be employed to provide the desired tension on the yarn as it is being wound off the cake. The weight is inside the cake in this particular drawing.

The preferred embodiment of the invention is shown in Figs. 5 to 8. It will be noted in Fig. 3 that the top and bottom of the cake are not wholly supported by the outside portions 27 of the bands. In the preferred form the bowed end portions 32 do not lie between the heads when the removable head is in its operative position. In this way the entire height of the cake is backed up by a straight edge from top to bottom of the cake, i. e., the straight outer sides 33 of the bands. The heads 34 and 35 have radial slots 36 cut through their walls and the bowed ends 32 of the bands are adapted to extend through these slots 36 to or past the outside of the head. In order to expand the periphery of the swift there is a camming shoulder 37 formed in the heads 34 and 35 at the inner end of each slot 36. In this preferred embodiment the dimensions of the parts are slightly different from the form shown in Figs. 1 to 4, the screws 38 which fasten the ends of the bands to the barrel 39 being, for instance, somewhat nearer the operative positions of the heads. This can be seen in Fig. 5. With this arrangement the bend in the bowed ends 32 is thrown more toward the periphery with a resultant greater taper in the periphery when the removable head 35 is off the barrel 37. As shown in Fig. 6, this increased taper has no marked effect on the dimensions or slope of the periphery when the removable head is on the barrel, except to eliminate the sloping portion facing the upper and lower edges of the cake, as shown in Fig. 3. The preferred construction also differs from the embodiment of Figs. 1 to 4 in several other details. Thus the collars carrying the heads have been eliminated and the nec-

essary collars 40, 41 have been formed as a part of the heads themselves. A key and a slot 42, 43 have been provided to keep the removable head in proper register with the barrel, and the spring clips are screwed to the outside of the heads 34 and 35 instead of being clamped between the heads and the collars. The spool 12, rather than being placed in the middle of the barrel (where it is inside the cake), is located on one end of the barrel outside the fixed head 34, where it is available for adjustment of the weight at all times. The number of spring clips 29 has been increased from four to five, which equals the number of spring bands employed. It will be observed that with this construction the cake is supported on the inside from top to bottom by long straight edges, the bands being of appreciable width to cover a large part of the inner surface of the cake, circumferentially speaking, and experience shows that there is no distortion of the cake. As in the previous embodiment, the combined radial pressure of the spring bands adjusting themselves to the taper of the cake, together with the lateral pressure between the heads, maintains the cake in perfect condition for transferring the yarn to a winding machine, whether the cake is dry or wet.

Many modifications not departing from the scope of my invention will occur to those skilled in the art.

What I claim is:

1. A yarn swift comprising a barrel and a plurality of loops lying across the swift attached only to the barrel and radiating therefrom, the outer sides of the loops forming the periphery of the swift, the ends of the loops being resilient and bowed, in combination with heads adapted to press against the sides of the loops, thereby increasing the periphery of the swift.

2. A swift for a yarn cake, comprising support means arranged axially of the swift and a plurality of resilient bands lying in planes containing the axis of the swift, said bands being bowed back upon themselves and mounted on the support means, in combination with heads adapted to press against the sides of the bows, thereby increasing the periphery of the swift, one or both of said heads being removable.

3. A swift for a yarn cake, comprising a barrel and a plurality of resilient bands attached only to the barrel and each bent into the form of a loop lying across the swift and radiating from the barrel, in combination with two heads on said barrel adapted to increase the periphery of the swift by pressing against the sides of the loops, one or both of said heads being removable.

4. A swift for a yarn cake, comprising a barrel, a plurality of flat resilient bands attached only to the barrel and each bent into the form of a loop lying across the swift and radiating from the barrel, in combination with two heads on said barrel adapted to increase the periphery of the swift by pressing against the sides of the loops, one of said heads being removable.

5. A swift for a yarn cake, comprising a barrel and a plurality of resilient bands attached only to the barrel and each bent into the form of a loop lying across the swift and radiating from the barrel, the outer sides of the loops being convex in cross-section to impart rigidity, in combination with two heads on said barrel adapted to increase the periphery of the swift by pressing against the sides of the loops.

6. A swift for a yarn cake, comprising a barrel and a plurality of loops lying across the swift

attached only to the barrel and radiating therefrom, the outer sides of the loops forming the periphery of the swift and being substantially rigid, the ends of the loops being resilient and bowed, in combination with heads on said barrel adapted to press against the ends of the loops and thereby increase the periphery of the swift.

7. A swift for a yarn cake, comprising a barrel and a plurality of loops lying across the swift attached only to the barrel and radiating therefrom, the outer sides of the loops forming the periphery of the swift, the ends of the loops being resilient and bowed, in combination with heads on said barrel adapted to press against the ends of the loops to increase the periphery of the swift, one of said heads being removable to give a tapered periphery to permit placing a cake on the swift.

8. A swift for a yarn cake, comprising a barrel and a plurality of loops lying across the swift attached to the barrel and radiating therefrom, the outer sides of the loops forming the periphery of the swift, the ends of the loops being resilient and bowed, in combination with heads on said barrel adapted to press against the ends of the loops and thereby increase the periphery of the swift, one of said heads being removable to give a tapered periphery smaller than when the head is in position, thereby permitting placing a cake on the swift.

9. A swift for a yarn cake, comprising a barrel and a plurality of loops lying across the swift attached to the barrel and radiating therefrom, the outer sides of the loops forming the periphery of the swift, the ends of the loops being resilient and bowed, in combination with heads on said barrel adapted to press against the ends of the loops and thereby increase the periphery of the swift, one of said heads being removable, means on said removable head capable of locking it in any desired position on said barrel.

10. A swift for a yarn cake, comprising a barrel and a plurality of loops lying across the swift attached only to the barrel and radiating therefrom, the outer sides of the loops forming the periphery of the swift and being substantially rigid, the ends of the loops being resilient and bowed, in combination with heads on said barrel whose inner faces are adapted to press against the ends of the loops and thereby increase the periphery of the swift.

11. A swift for a yarn cake, comprising a barrel and a plurality of loops lying across the swift attached to the barrel and radiating therefrom, the outer sides of the loops forming the periphery of the swift, the ends of the loops being resilient and bowed, in combination with heads on said barrel having slots therein in which the bowed ends of the loops may lie, said heads being adapted to press against the ends of the loops and thereby increase the periphery of the swift, one or both of said heads being removable to permit placing of a yarn cake on the swift.

12. A swift for a yarn cake, comprising a barrel and a plurality of loops lying across the swift attached only to the barrel and radiating therefrom, the outer sides of the loops forming the periphery of the swift and being substantially rigid and straight, the ends of the loops being resilient and bowed, in combination with heads on said barrel adapted to press against the ends of the loops and thereby increase the periphery of the swift, one of said heads being removable to permit placing of a yarn cake on the swift, both of said heads having openings therein in

which the bowed ends of the loops are adapted to lie when the heads exert pressure on them, thereby leaving only substantially rigid and straight surfaces to form the periphery of the swift.

13. A yarn swift comprising an axial support and a plurality of thread engaging members forming the periphery of the swift and lying across same radiating from the axial support, said members being carried by their ends which are attached only to the axial support at longitudinally spaced points so located as to provide bowed portions extending outwardly beyond the respective spaced points, in combination with means adapted to press axially against the bowed sides of the thread engaging members and thereby increase the periphery of the swift.

14. A yarn swift comprising an axial support and a plurality of loops forming the periphery of the swift and lying across same radiating from the axial support, the ends of the loops being resilient and bowed and said loops being carried by their ends which are attached only to the axial support, in combination with heads adapted to retain the yarn on the swift and to press the bowed sides of the loops together, thereby increasing the periphery of the swift.

15. A yarn swift comprising an axial support and a plurality of loops forming the periphery of the swift and lying across same radiating from the axial support, the ends of the loops being resilient and bowed and said loops being carried by their ends which are attached only to the axial support, in combination with members adapted to press against the sides of the loops, thereby increasing the periphery of the swift, and means for retaining one of said members in any desired position on the axial support.

16. A yarn swift comprising an axial support and a plurality of loops forming the periphery of the swift and lying across same radiating from the axial support, the ends of the loops being resilient and bowed and said loops being carried by their ends which are attached only to the axial support, in combination with members

adapted to press against the sides of the loops, thereby increasing the periphery of the swift, and means carried by the said members to secure a yarn covering thereto.

17. A yarn swift comprising support means arranged axially of the swift and a plurality of resilient bands lying in planes containing the axis and forming the periphery of the swift, said bands being bowed back upon themselves and mounted on the support means, whereby the bands can adjust themselves to give a periphery of non-uniform diameter according to the pressure of the yarn, in combination with heads each adapted to increase the periphery of its end of the swift by pressing against the sides of the bows, one or both of said heads being removable.

18. A swift for a yarn cake, comprising support means arranged axially of the swift and a plurality of resilient bands lying in planes containing the axis and forming the periphery of the swift, said bands being bowed back upon themselves and mounted solely on the support means, whereby the bands can adjust themselves axially to any slope on the interior of the cake, in combination with heads adapted to retain the cake on the swift and to expand the periphery of the swift by pressing inwardly against the sides of the bows, at least one of said heads being removable.

19. A swift for a yarn cake, comprising support means arranged axially of the swift and a plurality of bands lying across the swift attached only to the support means and radiating therefrom, the bands being bowed back upon themselves with the sides thereof resilient and the outer portions substantially rigid and forming the periphery of the swift, whereby the periphery is automatically adjustable to differences in cake diameter in an axial direction, in combination with heads adapted to retain the cake on the swift and to expand the periphery of the swift by pressing inwardly against the sides of the bows, at least one of said heads being removable.

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