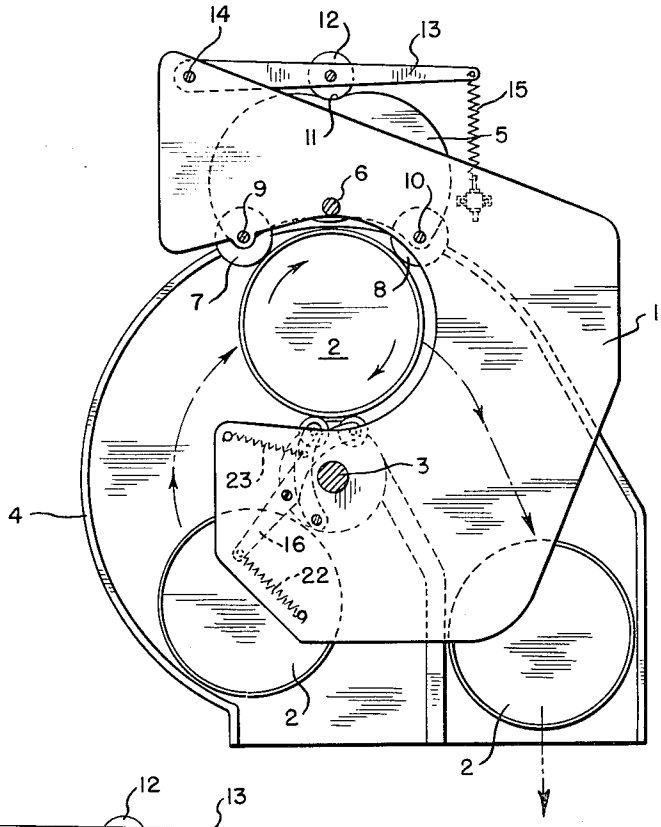
Dec. 7, 1965 G. G. FORNES 3,221,374

CAN-CENTERING APPARATUS

Filed Oct. 4, 1963

FIG. 1



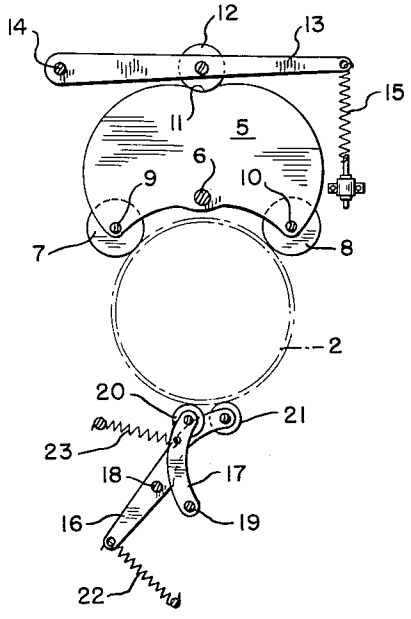


FIG. 2

INVENTOR
Gaston G. Fornes
BY
Dennie, Edmonds, Morton, Taylor & Adams
ATTORNEYS

United States Patent Office

3,221,374

Patented Dec. 7, 1965

3,221,374

CAN-CENTERING APPARATUS

Gaston G. Fornes, Charlottesville, Va., assignor to Institute of Textile Technology

Filed Oct. 4, 1963, Ser. No. 314,055
9 Claims. (Cl. 19—159)

This invention is for a can-centering mechanism which has particular application to the centering of sliver cans used with a sliver packing apparatus. The device has special application to a sliver packing apparatus incorporating a moveable coiler head and incorporating a rotary doffing mechanism.

Sliver, a composite of textile fibers arranged in a rope-like mass having a substantially circular cross-section, is conventionally packed into sliver cans by means of a coiler head disposed in a fixed position above the sliver can. The coiler head is equipped with a revolving plate so that the sliver is deposited into the sliver can in a coiled manner. It is also conventional to rotate the sliver can during the packing operation (usually clockwise in the same direction as that of the revolving plate of the coiler head) by means of a turntable upon which the can rests.

A novel sliver packing apparatus having a movable coiler head is described in co-pending Robinson et al. application Serial No. 284,693, filed May 31, 1963, of which the present applicant is a co-inventor. The apparatus there described is for a sliver packing apparatus having a vertically movable coiler head which is introduced into an empty sliver can to a point near the bottom of the can. As sliver is introduced into the can via the coiler head, the coiler head presses against the sliver coils, thereby maintaining constant pressure contact with each coil as it is deposited. The use of such a sliver packing apparatus enables greater and more uniform amounts of sliver to be packed into a sliver can.

A unique rotary doffing apparatus, described in the present applicant's co-pending application entitled "Doffing Apparatus" is another new development used in connection with the sliver packing apparatus having a movable coiler head. The rotary doffing apparatus essentially comprises a means by which empty sliver cans are moved into packing position upon the turntable below the coiler head, and after packing, are moved away. Simultaneously with the ejecting of the filled sliver can an empty can is moved into position for filling and the sliver extending from the doffed sliver can is cut.

Thus, it can be seen from the description of the movable coiler head sliver packing apparatus and the rotary doffing mechanism used in connection therewith, that two basic movements are involved preparatory to the filling of the sliver can; namely, the movement of the sliver can itself, and the insertion of the coiler head into the sliver can. A third motion, rotation of the sliver can, comes into play when the packing operation commences.

As a result of these movements of the sliver can and of the coiler head a critical centering problem arises. Because of the close tolerances between the coiler head and the interior of the sliver can, it is essential that the can be in an exact centered position with respect to the coiler head prior to the insertion of the coiler head into the can. Failure to so situate the sliver can may disrupt the packing operation and result in damage to the can or to the coiler head as the coiler head is dropped into the can. The sliver can must also be maintained in exact centered position during the packing operation to permit proper rotation of the can and smooth lifting of the coiler head.

From the foregoing it can be seen that a centering mechanism is essential to the efficient operation of the sliver packing apparatus. It must perform three basic

functions: (1) it must guide the sliver can into centered position, (2) it must hold the sliver can in centered position during the rotation of the can itself, and (3) it must permit the can to be ejected after it is filled.

The present invention is based upon the discovery that the above requirements of centering may be met by use of a rocking cam having centering wheels and a guide means to urge the sliver can into position against the rocking cam. Based upon this discovery, the present invention is for a can centering mechanism comprising a support means upon which is mounted a rocking cam. The rocking cam has two relatively spaced centering wheels and a cam stop indent within which is disposed a cam stop means when the rocking cam is in a neutral position. Also connected to the support means is a guide means for urging the sliver can against the rocking cam.

A better understanding of the invention will be had by reference to the drawing showing a preferred embodiment of the invention.

FIG. 1 is a plan view of the can centering mechanism as it is shown with respect to the doffing apparatus.

FIG. 2 is a plan view of the components of the can centering mechanism shown without the support plate.

Referring to FIG. 1, a support plate **1** is shown positioned above sliver can **2**. Sliver can **2** is shown in three positions, representing, in clockwise steps, the three principal phases of its movement in the packing operation. In the first position the can **2** is empty; in the second position the can is centered where it is rotated during packing; in the third position the filled can is being ejected. The details of the doffing apparatus which impel the sliver can **2** during the various phases of its movement are not given other than to indicate the central doffer shaft **3** and the guide rails **4** which guide the general course of the can **2**.

The principal operating parts of the can centering mechanism, which in the present embodiment are designed to engage the upper portion of the sliver can **2**, are best shown in FIG. 2. There, a rocking cam **5** is shown in a neutral position as when a sliver can is centered or when no can is in place. The rocking cam **5** is rotatable about a pivot **6**. Spaced apart at the inner parts of the cam **5** are two centering wheels **7** and **8**. The centering wheels **7** and **8** are rotatable about pins **9** and **10**, respectively. The function of the centering wheels **7** and **8** is to permit relative movement of the sliver can **2** with respect to the rocking cam **5** when they are in operative engagement with each other; for example, when the sliver can **2** is rotating in its centered position upon a turntable (not shown). Opposite the pivot **6** is an indent **11** on cam **5**. Indent **11** is designed to receive cam stop wheel **12** when rocking cam **5** is in a neutral position. Cam stop wheel **12** is in turn mounted upon lever **13** which is pivotally mounted upon support plate **1** by a lever pivot **14**. Lever **13** and cam stop wheel **12** are urged against the rocking cam **5** by means of the tension spring **15** connecting the lever **13** to the support plate **1**. The cam stop means comprising the lever and cam stop wheel serve to hold the rocking cam in a neutral position when light rocking pressures are exerted upon cam **5**. However, by reason of the force on the lever **13** by tension spring **15**, the cam **5** will be permitted to rotate about the axis of pivot **6** when sufficient unbalancing forces are exerted upon either of the wheels **7** or **8**.

Spaced opposite the rocking cam **5** and pivoted upon the support plate **1** are a pair of guide arms **16** and **17**. Guide arms **16** and **17** are pivoted upon support plate **1** at points **18** and **19**, respectively. At one end of each guide arm **16** and **17** are mounted guide wheels **21** and **20**, respectively. Guide wheels **20** and **21** are for the purpose of contacting the sliver can **2** and urging it against the centering wheels **7** and **8** of rocking cam **5**. Guide arms

16 and 17 are each connected to the support plate 1 by guide springs 22 and 23, respectively. Guide springs 22 and 23 urge guide arms 16 and 17 and their respective guide wheels 20 and 21 into can-engaging contact. In the preferred embodiment two guide wheels are shown for the purpose of adding stability to the action of the guide means.

The operating sequence of the can centering mechanism is as follows:

As the sliver can 2 is forced into packing position it must necessarily first contact wheel 7 and guide wheel 20, the distance between those points being less than the diameter of the sliver can. In so contacting the centering wheel 7 and guide wheel 20, sufficient pressure is brought upon the centering wheel 7 to cause rocking cam 5 to rotate clockwise away from its neutral position. As the sliver can 2 is forced past the centering wheel 7 and the guide wheel 20 through the opening created by the rocking of the rocking cam 5, it is urged toward the central position of the rocking cam 5. Upon passing the centering wheel 7 the can 2 will immediately shift into a central position between the centering wheel 7 and the centering wheel 8, contacting both of those wheels as it is urged toward the rocking cam 5. Having moved into position between the centering wheels 7 and 8 the rocking cam 5 will rotate back toward a neutral position and having reached that neutral position will be held there by the action of the cam stop wheel 12 disposed in indent 11. The can 2 in its centered position will continue to be positively held against the centering wheels 7 and 8 by guide wheel 20 and in addition by guide wheel 21. During the sliver packing operation the sliver can 2 is caused to rotate which rotation is freely permitted by the wheeled contact with the centering wheels and the guide wheels.

Upon completion of the packing operation the sliver can 2 is doffed. During the doffing of the sliver can 2 movement of the doffing mechanism and of the sliver clockwise path so that much greater pressure is exerted upon the centering wheel 8 and the guide wheel 21. The movement of the doffing mechanism and of the sliver can 2 will bring pressure against the centering wheel 8, causing the rocking cam 5 to rotate counter-clockwise about pivot 6. The rocking cam 5 will rotate to a degree which will permit the sliver can 2 to slide past the centering wheel 8 and the guide wheel 21. The turntable is thus left free for the placement of an empty sliver can and the cycle is then repeated.

I claim:

1. A can centering mechanism comprising
(a) a support,
(b) a rocking cam mounted upon said support and having
(i) two relatively spaced centering whels, and
(ii) a cam stopping indent,
(c) cam stop means mounted upon said support and having a portion thereof disposed in said indent when said rocking cam is in a neutral position, and
(d) guide means connected to said support and urging said can against said rocking cam.

2. A can centering mechanism comprising
(a) a support,
(b) a rocking cam mounted upon said support and having
(i) two relatively spaced centering wheels, and
(ii) a cam stopping indent,
(c) cam stop means comprising
(i) a spring tensioned holding means attached to said support,
(ii) a cam stop means mounted upon said holding means and urged by said holding means into said indent when said rocking cam is in a neutral position, and
(d) guide means connected to said support and spaced opposite said rocking cam to urge said can against said rocking cam.

3. A can centering mechanism according to claim 2 wherein said stop cam means is a wheel.

4. A can centering mechanism comprising
(a) a support,
(b) a rocking cam mounted upon said support and having
(i) two relatively spaced centering wheels, and
(ii) a cam stopping indent,
(c) cam stop means comprising
(i) a lever pivotally mounted upon said support,
(ii) a cam stop wheel connected to said lever and disposed in said indent when said rocking cam is in a neutral position,
(iii) spring tensioning means connected to said lever and urging said cam stop wheel into said indent,
(d) a guide wheel connected to said support and spaced opposite said rocking cam to urge said can against said rocking cam.

5. A can centering mechanism comprising
(a) a support,
(b) a rocking cam mounted upon said support and having
(i) two relatively spaced centering wheels, and
(ii) a cam stopping indent,
(c) cam stop means comprising
(i) a lever pivotally mounted upon said support,
(ii) a cam stop wheel connected to said lever and disposed in said indent when said rocking cam is in a neutral position,
(iii) spring tensioning means connected to said lever and urging said cam stop wheel into said indent,
(d) guide means connected to said support and spaced opposite said rocking cam, said guide means comprising
(i) a guide arm pivotally mounted upon said support,
(ii) a guide wheel connected to said guide arm, and
(iii) a guide spring connected to said guide arm and urging said guide wheel against said can.

6. A can centering mechanism comprising
(a) a support,
(b) a rocking cam mounted upon said support and having
(i) two relatively spaced centering wheels, and
(ii) a cam stopping indent,
(c) cam stop means comprising
(i) a lever pivotally mounted upon said support,
(ii) a cam stop wheel connected to said lever and disposed in said indent when said rocking cam is in a neutral position,
(iii) spring tensioning means connected to said lever and urging said cam stop wheel into said indent,
(d) guide means connected to said support and spaced opposite said rocking cam comprising
(i) a pair of guide arms pivotally mounted upon said support,
(ii) a guide wheel connected to each said guide arm, and
(iii) guide springs connected to said guide arms and urging said guide wheels against said can.

7. In a sliver packing apparatus a sliver can centering mechanism which mechanism comprises
(a) a support,
(b) a rocking came mounted upon said support and having
(i) two relatively spaced centering wheels, and
(ii) a cam stopping indent,
(c) cam stop means comprising
(i) a lever pivotally mounted upon said support,

(ii) a cam stop wheel connected to said lever and disposed in said indent when said rocking cam is in a neutral position,

(iii) spring tensioning means connected to said lever and urging said cam stop wheel into said indent,

(d) a guide wheel connected to said support and spaced opposite said rocking cam to urge said can against said rocking cam.

8. In a sliver packing apparatus a sliver can centering mechanism which mechanism comprises

(a) a support,

(b) a rocking cam mounted upon said support and having

(i) two relatively spaced centering wheels, and

(ii) a cam stopping indent,

(c) cam stop means comprising

(i) a lever pivotally mounted upon said support,

(ii) a cam stop wheel connected to said lever and disposed in said indent when said rocking cam is in a neutral position,

(iii) spring tensioning means connected to said lever and urging said cam stop wheel into said indent,

(d) guide means connected to said support and spaced opposite said rocking cam, said guide means comprising

(i) a guide arm pivotally mounted upon said support,

(ii) a guide wheel connected to said guide arm, and

(iii) a guide spring connected to said guide arm and urging said guide wheel against said sliver can.

9. In a sliver packing apparatus a sliver can centering mechanism which mechanism comprises

(a) a support,

(b) a rocking cam mounted upon said support and having

(i) two relatively spaced centering wheels, and

(ii) a cam stopping indent,

(c) a cam stop means comprising

(i) a lever pivotally mounted upon said support,

(ii) a cam stop wheel connected to said lever and disposed in said indent when said rocking cam is in a neutral position,

(iii) spring tensioning means connected to said lever and urging said cam stop wheel into said indent,

(d) guide means connected to said support and spaced opposite said rocking cam comprising

(i) a pair of guide arms pivotally mounted upon said support,

(ii) a guide wheel connected to each said guide arm, and

(iii) guide springs connected to said guide arms and urging said guide wheels against said sliver can.

No references cited.

DONALD W. PARKER, *Primary Examiner.*