

Oct. 16, 1962

P. GRETHER
DEVICE FOR THE REMOVAL OF WATER FROM
COILS OF YARN BY CENTRIFUGING

3,058,230

Filed Aug. 28, 1958

6 Sheets-Sheet 1

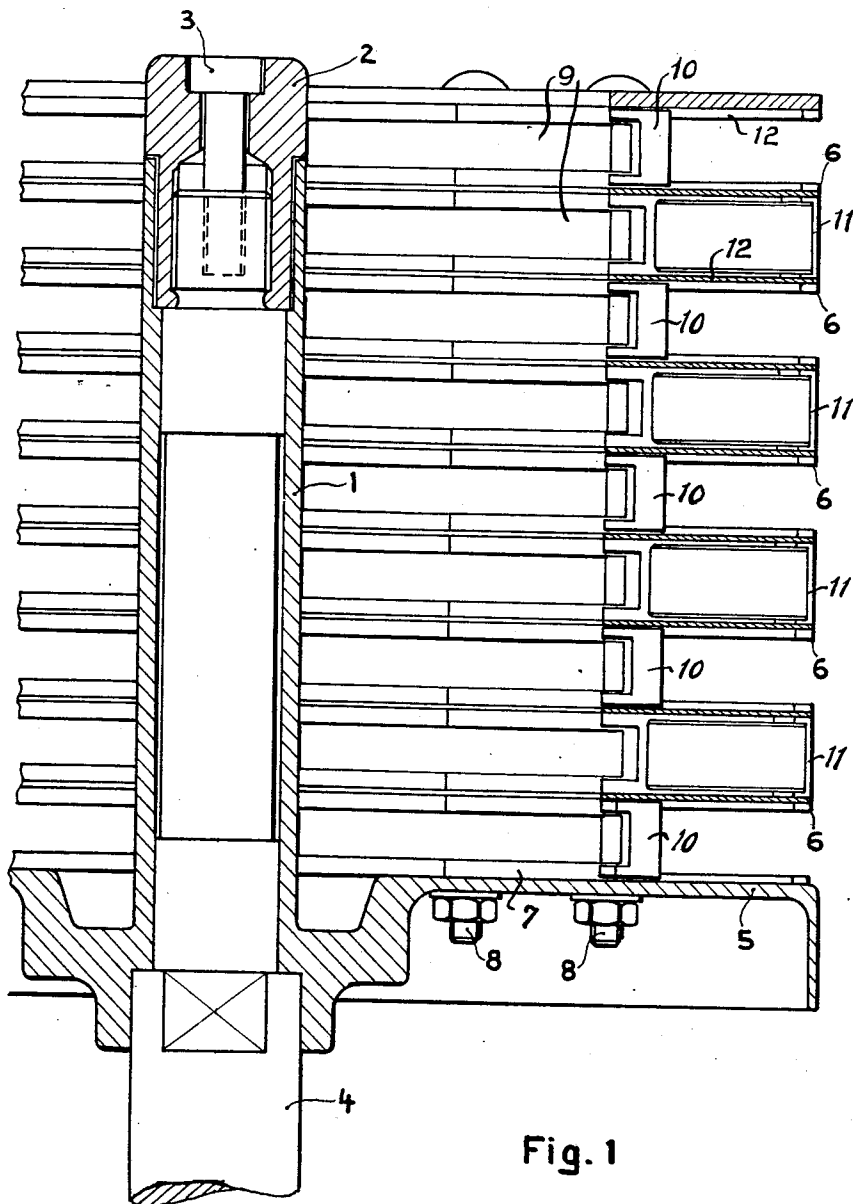


Fig. 1

Oct. 16, 1962

P. GRETHER
DEVICE FOR THE REMOVAL OF WATER FROM
COILS OF YARN BY CENTRIFUGING

3,058,230

Filed Aug. 28, 1958

6 Sheets-Sheet 2

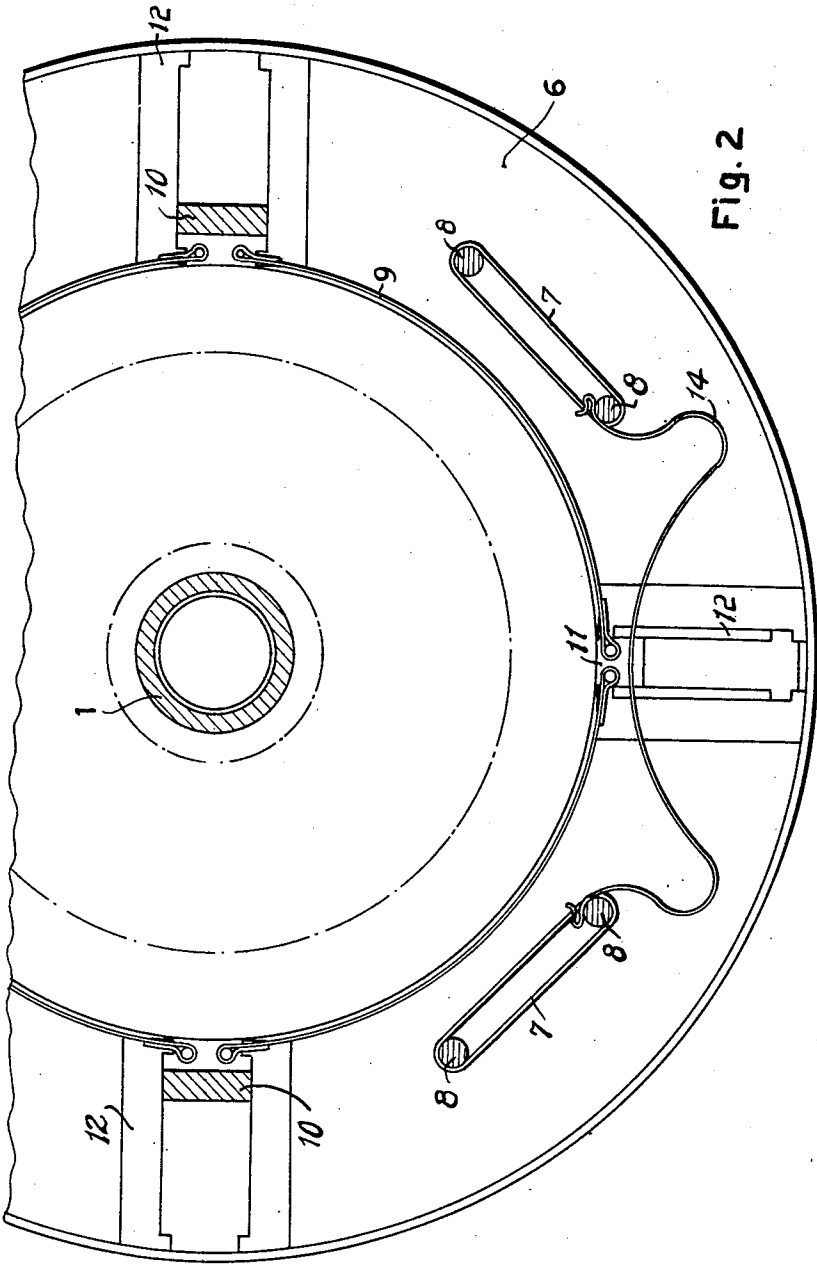


Fig. 2

Oct. 16, 1962

P. GRETHER
DEVICE FOR THE REMOVAL OF WATER FROM
COILS OF YARN BY CENTRIFUGING

3,058,230

Filed Aug. 28, 1958

6 Sheets-Sheet 3

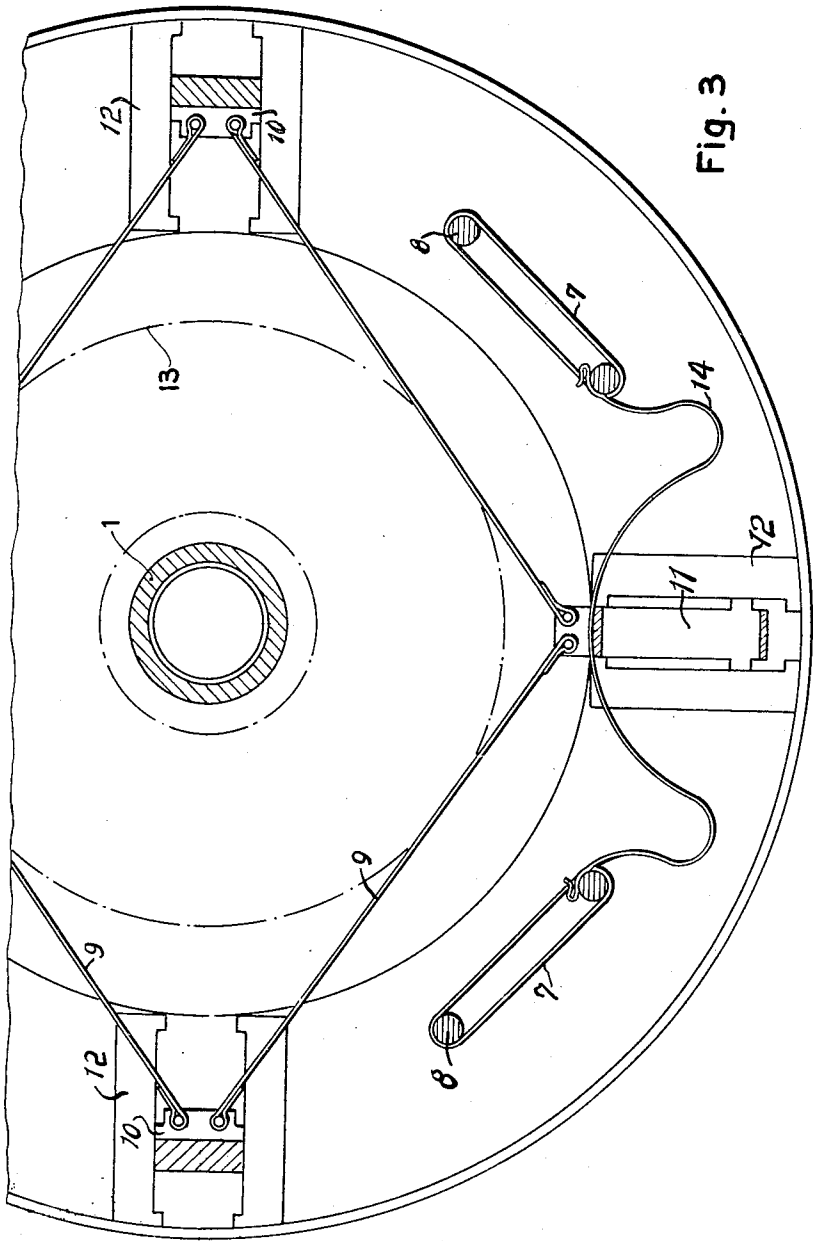


Fig. 3

Oct. 16, 1962

P. GRETHER
DEVICE FOR THE REMOVAL OF WATER FROM
COILS OF YARN BY CENTRIFUGING

3,058,230

Filed Aug. 28, 1958

6 Sheets-Sheet 4

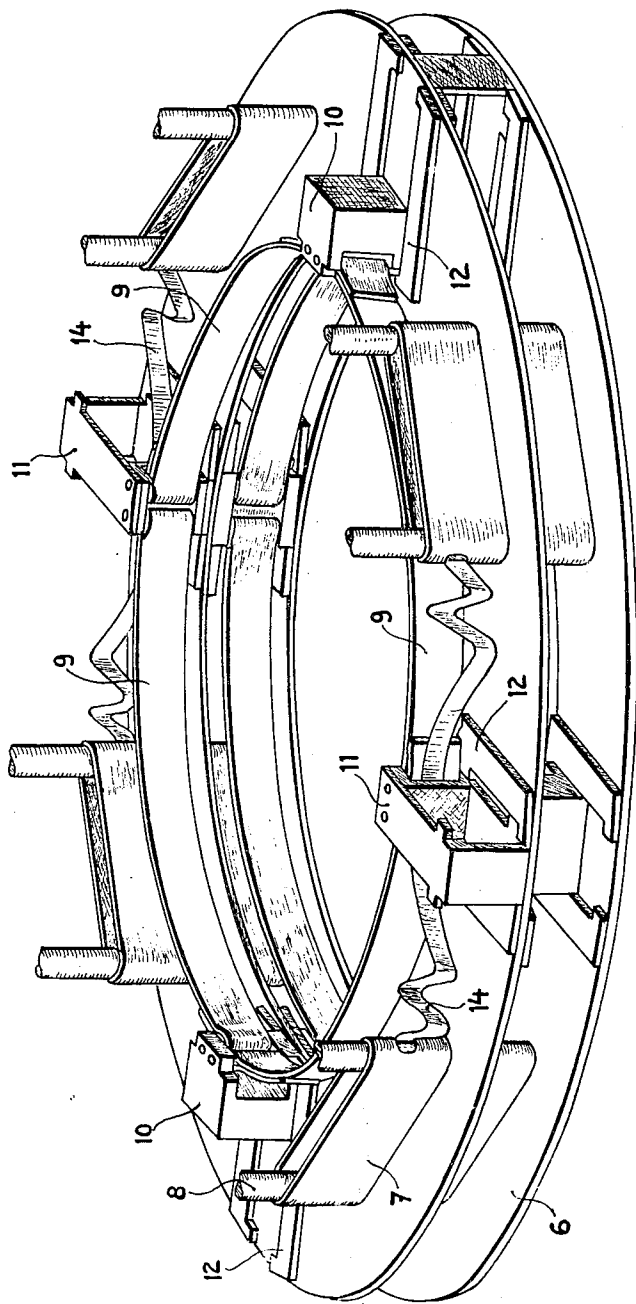


Fig. 4

Oct. 16, 1962

P. GRETHER
DEVICE FOR THE REMOVAL OF WATER FROM
COILS OF YARN BY CENTRIFUGING

3,058,230

Filed Aug. 28, 1958

6 Sheets-Sheet 5

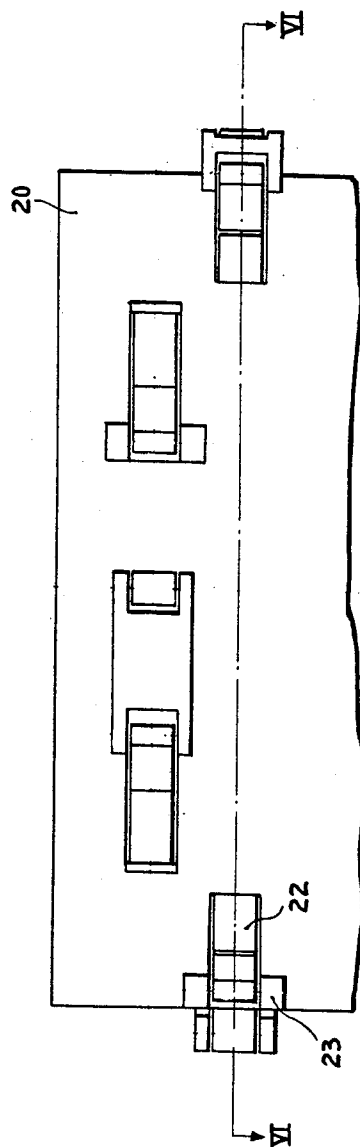


Fig. 5

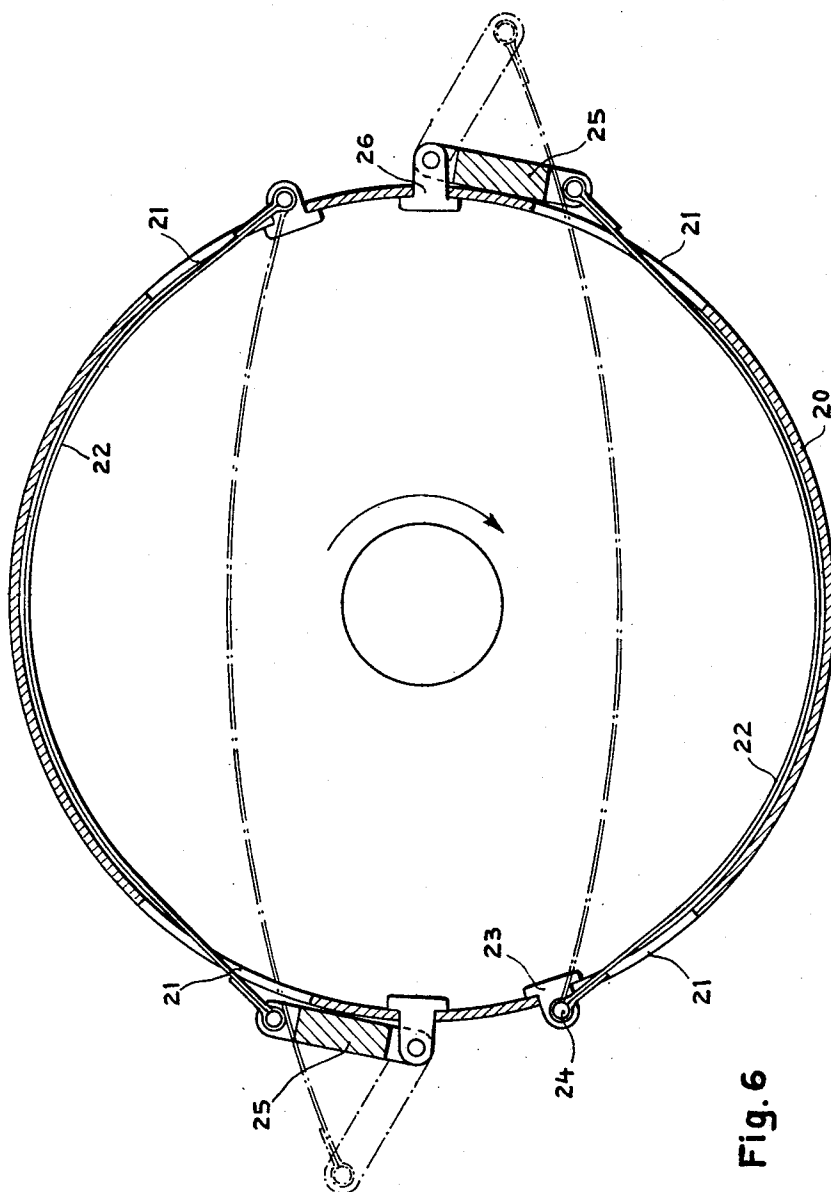
Oct. 16, 1962

P. GRETHER
DEVICE FOR THE REMOVAL OF WATER FROM
COILS OF YARN BY CENTRIFUGING

3,058,230

Filed Aug. 28, 1958

6 Sheets-Sheet 6



1

3,058,230

DEVICE FOR THE REMOVAL OF WATER FROM COILS OF YARN BY CENTRIFUGING

Paul Grether, Riedtalstrasse 3, Zofingen, Switzerland

Filed Aug. 28, 1958, Ser. No. 757,847

Claims priority, application Switzerland Sept. 2, 1957

3 Claims. (Cl. 34—58)

The present invention relates to a device for the removal of water from coils of yarn, by centrifuging.

In the removal of water from wet coils of yarn by centrifuging the coils of yarn are centrifuged singly, rotating about their own axes. This method has the advantage of a good water-removal effect, neither the sleeves nor the yarn being damaged. The centrifuging time is relatively short, and a radial loosening of the coil of yarn takes place, which has a favorable effect in the subsequent drying process, and permits higher unwinding speeds. However in this procedure it is necessary to prevent the coils of yarn from being deformed or even torn apart by the centrifugal force. For this purpose a support sleeve with a rigid protective cage has already been used. The disadvantage of this arrangement consists in that the rigid protective cage prevents effective projecting away of the liquid. If on the other hand the protective cage is arranged loosely, it no longer hinders the deformation of the coil, so that the threads break at higher speeds of rotation.

In order to remove this disadvantage, a centrifuge has already been used, which is equipped with pivotable holders which are pressed by centrifugal effect against the coils of yarn, when the sleeve is in rotation. Even in these arrangements, the use of pivotable holders is only partly satisfactory, since they do not come to bear with uniform pressure against the outer surfaces of the coils of yarn.

In accordance with the present invention a device for the removal of water from coils of yarn is proposed, which no longer possesses the above-mentioned disadvantages.

The novelty according to the invention consists in that at least one protective cage surrounding the coil of yarn is provided, the periphery of which has elements resilient in the radial direction, which form an at least approximately closed ring, and are pressed against the coil of yarn by centrifugal force, against spring action.

Two examples of embodiment of the object of the invention are illustrated in the accompanying drawing, wherein:

FIGURE 1 shows a vertical section through the device according to the first embodiment,

FIGURES 2 and 3 show a section each along the line I—I in FIGURE 1, in two different positions,

FIGURE 4 shows a perspective representation of a part of the device, and

FIGURES 5 and 6 show a second embodiment of the device,

FIGURE 6 representing a section along the line 6—6 in FIGURE 5.

In the drawings, the device for the removal of water from coils of yarn according to the first embodiment possesses a shaft 1, which is constructed as a sleeve and is secured by a nut 2 and a screw 3 to a driven shaft 4. The shaft 1 has at its lower end a plate 5, which is constructed as a circular, annular plate and more expediently consists in one piece with the shaft 1. Supported on the plate 5 for rotation with shaft 1 is a protective cage for the yarn. The protective cage includes annular plates 6 arranged one above the other on the shaft 1, which are held apart from one another by distance pieces 7. Clamping screws 8 are provided for the reception of the distance pieces 7, and extend parallel to the shaft 1 and

2

pass through the plates 6. In accordance with the embodiment as represented the clamping screws 8 are arranged in pairs, and serve together for the reception of a common distance piece 7. It should be observed that the internal diameter of the annular plates 6 is somewhat greater than the external diameter of the largest coil of yarn to be centrifuged.

Between the annular plates 6 there are arranged annular resilient elements 9, which, according to the embodiment as represented, are constructed as deformable parts of a circle, which are secured at their ends in pairs to common sliding shoes 10 and 11 which constitute holder means for the elements 9. As may be seen from FIGURE 4, the diametrically opposed sliding shoes 10 and the diametrically opposed shoes 11 are made similar, and are mounted in radial guides 12, so that the sliding shoes can move in the radial direction in these guides 12. The arrangement is made such that the sliding shoes 10 can be moved outwards and the sliding shoes 11 can be moved inwards. Furthermore the spacing of the sliding shoes 10 and 11 from the central axis and the weight thereof are so dimensioned that the product of weight multiplied by distance is greater for the sliding shoes 10 than for the sliding shoes 11.

The wet coil of yarn is placed upon the shaft 1, and set in rapid rotation by the shaft 4. Here the entire centrifuge cage rotates about its axis, the sliding shoes 10 moving outwards in the guides 12, due to centrifugal force, and assuming the position as illustrated in FIGURE 3. The resilient elements 9 are thus stretched out, and the sliding shoes 11 are drawn inwards in their guides 12, until they rest on the periphery of the coil body 13. Thus the coil body is held on the periphery.

For the return of the sliding shoes 10 and 11 into their initial positions, return springs 14 are provided, which are secured at one end on the sliding shoes and at the other on the pertinent distance piece 7.

As appears from FIGURE 1, the resilient elements 9 with sliding shoes and return springs are arranged over one another in storied fashion, the sliding shoes 10 and 11 being staggered by 90° in relation to the sliding shoes 10 and 11 of the adjacent stories, lying therebeneath and thereabove. In this manner the object is achieved that the coil body is held uniformly on the periphery. A further advantage of the device as described consists in that it is made absolutely symmetrical, which is especially important for very high-spread devices.

A variant of the device as described is represented in FIGURES 5 and 6.

The device comprises a protective cage including a sheet metal cylinder 20, which is provided with slots 21 disposed in the peripheral direction. Through these slots there are guided spring leaves 22, which cling closely to the inner side of the cylinder, and are secured with their ends to the outside of the cylinder.

The spring leaves 22 are distributed over the peripheral surface of the cylinder, arranged above one another in storied fashion, two spring leaves being distributed symmetrically on the periphery in relation to the cylinder axis on each story. One end of each spring leaf is secured in an associated holder 23 for pivoting about a spindle 24, and the other end of the spring leaf 22 is attached to a lever 25, which is mounted pivotably in a holder 26, on the outside of the cylinder periphery. The arrangement is made such that by the centrifugal effect the levers 25 come into the position illustrated in dot-and-dash lines causing the spring leaves 22 to be pressed against the coil of yarn (not shown). After the termination of the rotation, each spring leaf assumes its original form, and again fits closely against the inner wall of the cylinder jacket.

It should further be remarked that all the levers 25 are

pivotable in the same direction—according to FIGURE 6 in the counter-clockwise direction. The groups of spring leaves situated above one another are arranged with offsetting in the peripheral direction in relation to one another, so that they support the coil of yarn at different points.

What I claim is:

1. A device for the removal of water from coils of yarn by centrifuging, comprising a protective cage adapted for rotation, and radially flexible strips inside the protective cage, at least two of said strips normally defining a substantially closed circular ring for accommodating said yarn and holder means on said cage and engaging at least one of said strips, said holder means being outwardly movable in response to centrifugal force, thereby drawing said strip inwardly against the coils of yarn.
2. A device according to claim 1 wherein the strips are leaf springs extending peripherally along the cage.
3. A device according to claim 1 wherein said holder means include sliding shoes guided for movement in a radial direction.
4. A device according to claim 1 wherein said holder means includes diametrically opposed sliding shoes journaled in radially extending guides permitting movement of the sliding shoes radially outwardly in response to centrifugal force and two further diametrically opposed sliding shoes journaled in guides and movable radially inwardly out of position of rest.
5. A device according to claim 4 wherein the distance of the outwardly movable sliding shoes from the middle axis of the device and the weight of the sliding shoes

are greater than the distance and the weight of the inwardly movable sliding shoes, so that centrifugal force causes the outwardly movable sliding shoes to stretch the strips and pull the sliding shoes inwardly until the strips lie against the coils of yarn.

6. A device according to claim 1 wherein each strip constituted by a leaf spring is secured at one end by a hinge to the protective cage and at the other end to the free end of a lever hinged to the protective cage, said lever being swung outwardly in response to centrifugal force, thereby pulling against the coil of yarn the strip which in its position of rest lies closely against the inner surface of the protective cage.

7. A device according to claim 6 wherein the protective cage is in the form of a cylindrical cover having peripheral slits through which the strips extend and wherein each of the strips is secured to the outside of the cage and extends between the securing point through the slits and along the inside of the cage.

8. A device according to claim 7 wherein the leaf spring pairs are arranged in planes at different levels and are mutually staggered at the periphery of the cage.

References Cited in the file of this patent

UNITED STATES PATENTS

987,745	Reynolds	Mar. 28, 1911
1,770,412	Leuchs	July 15, 1930
2,243,000	Brown	May 20, 1941

FOREIGN PATENTS

275,387	Germany	June 16, 1914
---------	---------	---------------