APPARATUS FOR CRIMPING GROUPS OF SYNTHETIC FILAMENTS

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ABSTRACT

The present disclosure is directed to an improved device for crimping groups of textile filaments, for example, synthetic filaments utilizing a pair of rollers and a compression compartment. The device produces a uniform crimp and contains features which facilitate the cleaning and maintenance thereof.

14 Claims, 2 Drawing Figures
APPARATUS FOR CRIMPING GROUPS OF SYNTHETIC FILAMENTS

BACKGROUND OF THE INVENTION

The present invention relates to an apparatus for crimping groups of synthetic filaments, also called tows, which comprises a pair of rollers and a compression compartment provided with a movable, that is, a swivellable plate for holding the material back in the compression compartment and producing an adequate compression force.

When considering all of the elements of the production of synthetic fibers, the crimping devices are the most critical, necessitating very careful and lengthy maintenance. In order to produce a perfectly uniform crimp of the filaments, the device must at all times be absolutely clean and correctly adjusted. For cleaning purposes, the well-known forms of construction of the crimping device have to be dismounted, i.e., the compression compartment must be removed. This dismounting and remounting as well as the subsequent readjustments are very time consuming. This is the reason why the cleaning works are generally delayed as long as possible, even though this somewhat results in a somewhat inferior crimping effect.

Very often, manufacturers install additional crimping devices in order to be able to dismount and clean the devices in turns.

With the well-known crimping devices it is inevitable that filaments will cling to the machine. This usually happens at the passages between the movable and stationary machine element, i.e., at the passages between the rollers and the top and bottom plates of the compression compartment and at the edges of the top and bottom and the side plates.

SUMMARY OF THE INVENTION

An object of the present invention is to avoid the prior art disadvantages in crimping textile materials.

Another object of the present invention is to provide a crimping device which produces a uniform crimp and which can be much more easily cleaned and maintained.

Other objects and further scope of applicability of the present invention will become from the detailed description given hereinafter; it should be understood, however, that the detailed description and specific examples, while indicating preferred embodiments of the invention, are given by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from this detailed description.

Pursuant to the present invention, the above-mentioned disadvantages may be eliminated and a much improved crimping device can be achieved by supporting the compression compartment and the movable plate to be swivellable, the movable plate being swung out to one side and the compression compartment to the other.

Here it is of advantage to provide the pressure cylinders, e.g., compressed air cylinders, with an appropriate pressure rod system which is connected to the swivelling machine elements. When the machine is set for operation, the compression compartment and the movable plate can be fixed by means of a mechanical quick-action lock, e.g., an eccentric crossbar. However, in this case, too, it is advantageous to use pressure cylinders for fixing the compression compartment and the movable plate in the operating position. These elements are then pressed against buffers by means of a certain amount of pressure force and maintained in the operation position. It is possible to use the pressure cylinders as well as the rod system connected therewith and serving for swinging out the compression compartment and the movable plate, for the adjustment and the fixing of these elements in the operation position, too. An especially sturdy support of the swivellable parts of the compression compartment can be obtained if the swivel axes, i.e., the swing bases of these parts are mounted outside the main bearing axis, i.e., the bearing axis of the pair of rollers. This arrangement permits the reinforcement of the main bearings and the avoidance of any undesired bending of said bearings. An absolutely smooth running of the crimping device is obtained if the top plate of the compression compartment is movable.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will become more fully understood from the detailed description given hereinbelow and the accompanying drawings which are given by way of illustration only and are thus not limiting of the present invention and wherein:

FIG. 1 shows the apparatus of the present invention in operating position; and

FIG. 2 shows the apparatus of FIG. 1 in the cleaning position.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings, the apparatus of the present invention comprises a pair of rollers with a stationary top roller 1 and a swivellable bottom roller 2. By means of these rotating rollers, the groups of synthetic filaments (not shown in the drawing) are pressed into a subsequent compression compartment 3. This compression compartment 3 has a swivellable bottom plate 4 and a top plate 5 which is stationary in operating position and rigidly connected to sideplates 6.

According to the present invention, the movable plate 4 as well as the rest of the compartment, i.e., elements 6 and 5 are supported to be swivellable around an axis 7. Through a system of rods 8, these compartment elements 4, 5, and 6 are connected to compressed air cylinders 9, permitting the elements 4, 5 and 6 to be swung out into a cleaning position as well as to fix these compartment elements 4, 5 and 6 in the operating position.

The bottom roller 2 is supported to be swivellable around an axis 10 and in the operating position it is pressed against the top roller 1 by means of another pressure cylinder 11. For cleaning purposes it can be moved downwards, as shown in FIG. 2. Since the movable plate 4 is supported on a traverse 13 on which also the roller 2 is supported, this moving-down action permits the swinging out of element 4 as well as the rest of the compression compartment, i.e., elements 5 and 6. At the sideplates 6 of the compression compartment 3 are provided with lamellas 12 which seal off the compression compartment against the rollers 1 and 2 when being set to operating position.

The axis 7 is supported on sideplates 14 which are in turn swivelable around the axis of the roller 2 so that the movable plate 4, the axis 7 and the sideplates 14 can be moved upwards by means of the pressure cylinder 9 until the bottom plate 4 is in contact with the top plate 5. When operation of the machine begins, these elements are maintained in this position until the compression force is produced. By means of this compression force the moved-up elements are then pressed into the position which is shown in FIG. 1.

The invention being thus described, it will be obvious that the same may be varied in many ways. Such variations are not to be regarded as a departure from the spirit and scope of the invention, and all such modifications as would be apparent to one skilled in the art are intended to be included.

What is claimed is:

1. A device for crimping groups of textile filaments which comprises a pair of opposing rollers disposed one above the other, one of said roller being mounted in a stationary manner and the other of said rollers being swivellably mounted, a compression compartment comprising a swivellable bottom plate and a top plate which is stationary in operating position and rigidly connected to sideplates, said compression compartment being associated with the nip of the rollers on one side of said rollers, pressure cylinder means associated with the top and bottom plates of the compression compartment for swing-}

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2. The device of claim 1, wherein lamellas are provided at the sideplates of the compression compartment to seal off said compartment against the rollers when being set in the operating position.

3. A device for crimping groups of textile filaments which comprises a pair of opposing roller means, one roller means being mounted in a stationary manner and the other roller means being swivelably mounted, a compression compartment associated with said pair of roller means for receiving groups of textile filaments from said roller means, said compression compartment having a swivelable plate adapted to hold the textile filaments back in the compression compartment and to produce an adequate compression force for crimping said filaments in the operating position of said device, said swivelable plate being supported to be swivelable to one side and the remaining portion of the compression compartment being supported to be swivelable to the other side, and operating means associated with the compression compartment for swinging said plate and said remaining portion of said compartment out of the operating position.

4. The device of claim 3, wherein pressure cylinder means are associated with the swivelable plate and the remaining portion of the compression compartment for making the swivel motion possible.

5. The device of claim 4, wherein the swivelable plate and the remaining portion of the compression compartment are fixed in operating position by said pressure cylinder means.

6. The device of claim 5, wherein the pressure cylinder means are compressed air cylinders.

7. A device for crimping groups of textile filaments which comprises a pair of opposing roller means, one roller means being mounted in a stationary manner and the other roller means being swivelably mounted, a compression compartment associated with said pair of roller means for receiving groups of textile filaments from said roller means, said compression compartment having a swivelable plate adapted to hold the textile filaments back in the compression compartment and to produce an adequate compression force for crimping said filaments in the operating position of said device, operating means associated with the compression compartment for swinging the plate and the remaining portion of said compartment out of the operating position and means including a mechanical quick-action lock for fixing said plate and the remaining portion of said compression compartment in the operating position.

8. The device of claim 7, wherein the quick-action lock is an eccentric crossbar.

9. A device for crimping groups of textile filaments which comprises a pair of opposing roller means, one roller means being mounted in a stationary manner and the other roller means being swivelably mounted, a compression compartment associated with said pair of roller means for receiving groups of textile filaments from said roller means, said compression compartment having a swivelable plate adapted to hold the textile filaments back in the compression compartment and to produce an adequate compression force for crimping said filaments in the operating position of said device, operating means associated with the compression compartment for swinging said plate and the remaining portion of said compartment out of the operating position, said operating means also serving at the same time to set and to fix the compression compartment in the operating position.

10. A device for crimping groups of textile filaments which comprises a pair of opposing roller means, one roller means being mounted in a stationary manner and the other roller means being swivelably mounted, a compression compartment associated with said pair of roller means for receiving groups of textile filaments from said roller means, said compression compartment having a swivelable plate adapted to hold the textile filaments back in the compression compartment and to produce an adequate compression force for crimping said filaments in the operating position of said device, said plate being mounted about one swivel axis and the remaining portion of said compartment being mounted about another swivel axis, each of said roller means being provided with bearings in which said roller means are rotatably mounted, said swivel axes being mounted outside the bearing axis of each of said roller means and operating means associated with the compression compartment for swinging said plate and the remaining portion of said compartment out of the operating position.

11. A device for crimping groups of textile filaments which comprises a pair of opposing roller means, one roller means being mounted in a stationary manner and the other roller means being swivelably mounted, a compression compartment associated with said pair of roller means for receiving groups of textile filaments from said roller means, said compression compartment having a swivelable plate adapted to hold the textile filaments back in the compression compartment and to produce an adequate compression force for crimping said filaments in the operating position of said device, said compression compartment also having a movable top plate and operating means associated with the compression compartment for swinging said plates and the remaining portion of said compartment out of the operating position.

12. The device of claim 11, wherein said swivelable plate acts as a bottom plate in said compartment and the top plate is stationary in the operating position and is rigidly connected to said plates of said compression compartment.

13. A device for crimping groups of textile filaments which comprises a pair of opposite roller means, one roller means being mounted on stationary support means, and the other roller means being mounted on swivelably movable support means whereby said other roller means is displaceable from said one roller means, a compression compartment operationally associated with said pair of roller means for receiving filaments therefrom, said compartment having a movable plate adapted to hold the textile filaments back in the compartment and to produce an adequate compression force for crimping said filaments, said movable plate being mounted on said swivelably movable support means so that said plate is displaceable with said other roller means.

14. The device of claim 13, wherein said movable plate is mounted to be pivoted out of the operating position and means are operatively associated with said plate for swinging said plate out of said operating position.