Oct. 24, 1967 H. GASSNER 3,348,370

DRIVE ARRANGEMENT FOR FALSE TWISTING DEVICES

Original Filed Feb. 23, 1960

FIG. 1

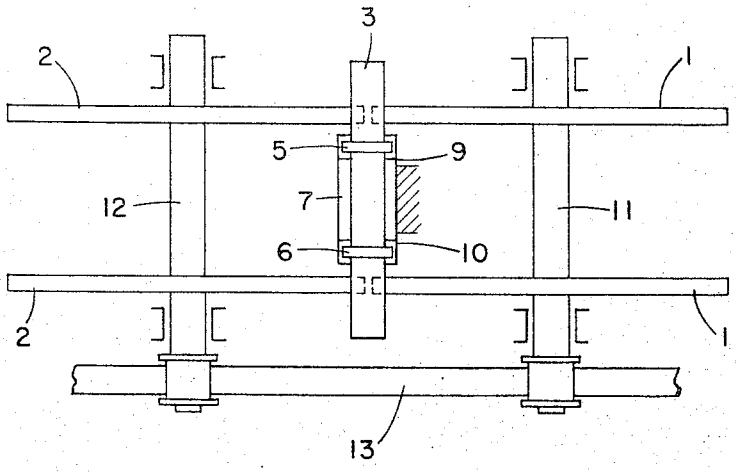
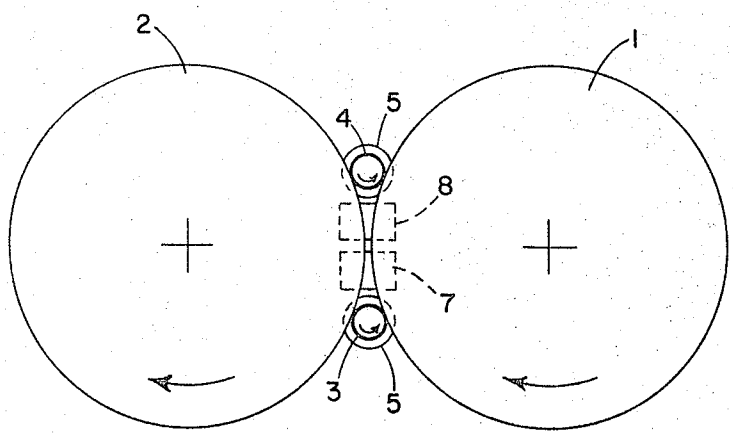


FIG. 2



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United States Patent Office 3,348,370
Patented Oct. 24, 1967

3,348,370

DRIVE ARRANGEMENT FOR FALSE TWISTING DEVICES

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Continuation of application Ser. No. 10,326, Feb. 23, 1960. This application July 5, 1966, Ser. No. 562,698
Claims priority, application Germany, Feb. 25, 1959, K 37,090
8 Claims. (Cl. 57—77.45)

This application is a continuation of my parent application Ser. No. 10,326, filed Feb. 23, 1960, now abandoned.

This invention relates to a drive arrangement for false twisting devices used for the continuous curling of synthetic filaments and comprising twisting tubes. There has already been suggested in the prior art a drive arrangement for false twisting devices of this general type in which each twisting tube is so disposed in the vicinity of a magnet, preferably a solenoid, arranged behind a drive member such as a drive belt or a drive pulley, that the lines of force of the stationary magnet will hold the twisting tube in position in relation to the said drive member and will urge the twisting tube against the drive member so that the twisting tube can be rotated by said drive member. The said twisting tube may be supported and guided by a fixedly mounted cage.

The present invention presents an improvement in a drive arrangement of this general type by providing for the twisting tube to be disposed between two unidirectionally drivable pairs of discs having their axes extending in parallel directions and with each of the opposed pairs of discs being disposed in a common plane, the twisting tube being held in position and at the same time urged against the peripheries of the two pairs of drive discs by the lines of force of a stationary magnet, preferably an electro-magnet.

This drive arrangement according to the present invention affords important advantages. Firstly, the lines of force of the magnet holding the twisting tube in position will no longer be weakened by a structural member such as a drive belt disposed between the magnet and the twisting tube. Secondly, it is possible, according to the present invention, to dispose the magnet at a very small distance from the twisting tube. Where the pairs of drive discs are driven at a rate of, say, 2500 r.p.m., the discs having a diameter of about 12 inches (300 mm.), the twisting tubes having a diameter of, for example, 5/16 in. (8 mm.), will rotate at as high a speed as 100,000 r.p.m. From this it will be understood that it will not be difficult to attain rotary speeds ranging from 100,000 to 200,000 r.p.m. or even considerably higher, without the bearings of the drive discs being subjected to stresses exceeding those presently known to occur in spinning spindles and the like. Furthermore, the twisting tubes require no anti-friction or journal bearings and can therefore be manufactured at considerably lower cost, and moreover the twisting tubes require no attention during operation. The use of electro-magnets for the aforeindicated purpose is preferred because they permit any desired magnetic forces of attraction to be produced.

According to the present invention, the pairs of discs driving the twisting tubes are disposed in a common plane in relation to one another.

Other objects and features of the invention will become apparent as the description proceeds, especially when taken in conjunction with the accompanying drawing, illustrating a preferred embodiment of the present invention, wherein:

FIG. 1 is a diagrammatic side elevational view of a drive arrangement according to the present invention; and

FIG. 2 is a plan view of the embodiment of FIG. 1.

In the embodiment of FIGS. 1 and 2, the drive arrangement includes two pairs of drive discs **1** and **2**, the axles **11** and **12** of the two pairs of discs extending in parallel directions, and the discs **1** and **2** of each pair being disposed in a common plane, the discs being driven to rotate in the same direction. Disposed between the two pairs of drive discs are two twisting tubes **3** and **4** having no fixed bearings, each twisting tube being provided with two collars **5** and **6**. Two fixedly mounted electro-magnets **7** and **8** are provided, one electro-magnet being associated with each of the twisting tubes **3** and **4**. The collars **5** and **6** of each twisting tube are disposed opposite the pole pieces **9** and **10** respectively of the electro-magnets. In this manner, the twisting tube is guided in axial as well as radial directions by the lines of force of the electro-magnet and is brought into frictional contact with the pairs of drive discs **1**, **2**. The pairs of drive discs are carried by shafts **11** and **12** which are driven by belt means **13**. It will be understood, however, that the said shafts may be driven in any other suitable manner.

As described thus far, both of the two associated pairs of drive discs are arranged to be positively driven. However, it is also possible to provide for only one pair of drive discs, for example the pair **1**, to be driven in rotation and to cause the respective other pair of drive discs, i.e. the pair **2**, to idle and thus to serve the function of guide discs. To still further improve the running characteristics, the peripheries of one or both of the pairs of drive discs may be covered with a material having a high coefficient of friction, such as rubber for example. Where at least the collars **5**, **6** of the twisting tubes are made of a magnetic material, the twisting tubes themselves may be made of a non-magnetic material.

What is claimed is:

1. A device for imparting a false twist to synthetic filaments in a continuous operation, said device comprising a twisting tube member hollow throughout for the passage therethrough of the synthetic filament to be false twisted and adapted for rotation, two pairs of rotatable drive discs mounted for rotation on parallel axes, the opposed discs of each pair being disposed in a common plane, drive means for unidirectionally driving said drive discs, and a bipolar magnet fixedly disposed between said pairs of drive discs with both poles of said magnet being disposed in close proximity to said twisting tube member, said twisting tube member consisting at least partially of magnetic material and being held in position and urged into frictional contact with the peripheries of said pair of drive discs in the nip thereof by the magnetic force lines of said magnet, with the twisting tube member being driven by the said drive discs.

2. A device for imparting a false twist to synthetic filaments in a continuous operation, said device comprising a twisting tube member hollow throughout for the passage therethrough of the synthetic filament to be false twisted and adapted for rotation, two pairs of rotatable drive discs mounted for rotation on parallel axes, the opposed discs of each pair being disposed in a common plane, drive means for unidirectionally driving said drive discs, and a bipolar magnet fixedly disposed between said pairs of drive discs with both poles of said magnet being disposed in close proximity to said twisting tube member, said twisting tube member comprising non-magnetic material and also comprising two collars of magnetic material disposed opposite the respective pole pieces of said magnet and close to the inner surface of said discs, said twisting tube member being held in position and urged into frictional contact with the peripheries of said pairs of drive discs in the nip thereof by the magnetic force lines of said magnet, with the twisting tube member being driven by the said drive discs.

3. Apparatus for false twisting textile yarns, which comprises a pair of rollers each comprising a pair of discs, at least one of which rollers is driven, the rollers being spaced one from the other to form a crotch between their respective discs, an elongated twisting tube hollow throughout for the passage therethrough of the textile yarn to be false twisted and having its ends extending beyond said discs and positioned in said crotch in frictional engagement with the peripheral edges of said discs, and bipolar magnetic means acting on said twisting tube for maintaining the same in said position and in said frictional engagement, both poles of said bipolar magnetic means being disposed in close proximity to said elongated twisting tube, the respective discs of said rollers being disposed in the same plane with respect to each other.

4. The combination of claim 3, wherein two twisting tube members, each having a bipolar magnet associated therewith, are separately disposed in the nips formed by the said pairs of discs.

5. The combination of claim 3, wherein the said discs are made of a non-magnetic material.

6. The combination of claim 3, wherein the peripheral surfaces of the said discs are covered with a material having a high coefficient of friction.

7. The combination of claim 3, wherein both pairs of discs are positively driven by drive means.

8. The combination of claim 3, wherein only one pair of discs is arranged to be driven in rotation, the other of the two pairs being arranged to idle and to serve the function of a pair of guide discs.

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JOHN PETRAKES, *Primary Examiner.*