L. NOTARBARTOLO ET AL

THREADEX STORING AND THREAD ADVANCING DEVICE
COMPRISING AN IDLER ADVANCING ROLLER
Filed March 1, 1954

INVENTORS
LUIGI NOTARBARTOLO
GAETANO BARBIANO DI BELGIOJOSO
GAETANO BRUNI

ATTORNEYS
THREAD STORING AND THREAD ADVANCING DEVICE COMPRISING AN IDLER ADVANCING ROLLER

Luigi Notarbartolo, Gaetano B. di Belgioioso, and Gaetano Brun, Milan, Italy, assignors, by mesne assignments, to Saebo Viscosa Societa Nazionale Industria Atticizzazione Viscosa S.p.A., Milan, Italy, an Italian company

Application March 1, 1954, Serial No. 413,412
Claims priority, application Italy March 7, 1953
6 Claims. (Cl. 28—71.3)

It is known to stretch or cold draw filaments or bundles of filaments or slivers of various textile materials, especially synthetic polymers.

The cold drawing of synthetic filaments, which are to be stretched to several times their original length, is a particularly delicate and important operation.

Generally speaking, the drawing, in particular of synthetic materials, is conveniently carried out by causing the filaments to travel successively over two devices which impart to the filaments considerably different linear speeds: more precisely, the filaments are taken up by the second device with a linear speed that is a multiple of the speed with which they are delivered by the first device. The devices in question often consist of groups or couples of cylinders.

The present invention relates to an improvement in cold drawing devices of the type described, consisting of a main roller and an advancing roller, the latter being generally of a smaller diameter and having its axis askew with respect to that of the first mentioned roller. The continuous filaments or bundles of filaments or slivers, hereinafter generally called thread, arrange themselves, in devices of this kind, in a series of successive turns, that is, in a substantially helical path; therefore, the length of thread which is in contact with one of such devices at any given moment, is relatively great, whereby it can be stated that the device stores the thread besides causing it to travel forth, and the device is called thread storing and thread advancing device. As has already been said, a drawing device generally comprises two thread storing and thread advancing devices, the first of which delivers the thread at a low speed while the second takes it up at a high speed. This invention relates to the low speed or feed devices, and will be better understood with reference to the drawing shows in lateral elevational view an improved feed device according to the invention.

In said device, the main roller 10 is directly driven to rotate, while advancing roller generally indicated at 11 is an idler and is drawn into rotation by the thread itself, shown at 12a—12b. The particular constructional and assembling details of the rollers, their supports, the drive transmission etc., have no importance to the ends of the invention and therefore are not illustrated in the drawings.

Now, it has been found that the portion of thread indicated at 12b, which goes to the high speed storing and advancing device, practically travels at the same speed at which the thread is drawn from said device or at least at a speed that is considerably greater than the peripheral speed of the rollers of the feed device illustrated in the drawing.

The portion 12a of the thread, on the contrary, travels at this latter speed, because it is influenced by no moving part other than the rollers of the feed device which directly actuates it. The difference between the two distinct speeds of the thread is generally considerable.

As a consequence, the advancing or idler roller is caused to rotate at a speed that lies between the two aforesaid distinct speeds of the thread. Pronounced slippages occur under these conditions between roller 11 and thread, the turns of the thread overlap each other, the thread travels in a disorderly manner and is irregularly fed.

According to the present invention, such drawbacks are eliminated by dividing the roller 11 in more than one independent section; the embodiment illustrated in the drawing is the simplest possible since only two separate sections 11a and 11b are provided therefor. In practice, section 11a is generally almost as long as the main roller 10, while section 11b is short and supports only the last few turns or even only the single last turn of the thread. It has been found that under such conditions the section 11b of the advancing roller rotates with the same linear speed as the section 12b of the thread and that the drawing effected on the thread is not felt beyond the zone of the main roller over which the last turn of thread travels before passing to the section 11b of the advancing roller; said zone of the main roller is illustrated in the drawing by the bracketed portion A. To make certain that the drawing of the thread be completed within the aforesaid zone, the same may be provided with a surface adapted to generate considerable friction when the thread slides over it.

Under these conditions all the turns of thread supported by roller 11a travel at practically the same speed. The turns remain perfectly regular, do not slip and do not overlap each other.

The present invention may be applied to the stretching of any type of single filaments as well as to stretching of bundles of filaments or slivers such as are produced for instance in the manufacture of spun fibres from any textile materials. The surface of one or both rollers may be grooved, knurled or roughened in any way, or they may be smooth.

What we claim is:

1. Thread storing and thread advancing device for the drawing of filaments or bundles of filaments, comprising two rollers having their axes askew to one another for storing and advancing the filaments in a plurality of spiral turns, one of said rollers being driven and the other being an idler, said idler roller comprising a plurality of separately rotatable sections following one another in an axial direction and separately operable at different peripheral speed, each section being driven to rotate by the spiral turn of the filaments engaging said section, and at a peripheral speed equal to the linear speed of said spiral turn.

2. Device according to claim 1, wherein the section of the idler roller that comes last in the direction of travel of the filaments, is so short as to support only the last few spiral turns of the filament.

3. Device according to claim 1, wherein the section of the idler roller that comes last in the direction of travel of the filaments, is so short as to support only the last spiral turn of the filament.

4. Device according to claim 1, wherein the driven roller is provided with a surface having a high friction coefficient with respect to the filaments, whereby the cold drawing of said filaments is substantially completed in the section of said roller over which they travel for the last time before passing to the last section of the idler roller, so that all the spiral turns of the thread that are not supported by the aforementioned last section of the driven roller travel substantially at the same linear speed.

5. Device according to claim 1, wherein the idler roller is divided into two sections.

6. Device according to claim 1, wherein the driven roller has a diameter considerably larger than the diameter of the idler roller.

No references cited.