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(54) Friction-based supply set for textile thread

Auf Reibung basierende Zuführeinheit für Textilfaden

Ensemble fournisseur basé sur la friction pour fil textile

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Description

This invention relates to the field of textile machines, and in particular to supply sets which, in said machines, draw the textile thread by friction, sending it toward a take-up bobbin. At the current state of the art, said supply sets as disclosed in DE 2 054 151 A, which corresponds to the preamble of claim 1, are composed of two like coaxial gearwheels that are equipped with n teeth and engage frontally. The teeth are shaped in a particular way, known to one skilled in the art, and have the characteristic that they exhibit an inclined or curved profile, such that each pair of mutually engaging teeth forms a V-shaped groove that is open toward the outer truncated circumferences of said gearwheels.

The textile thread is made to follow a path between a supply spindle and a take-up bobbin, in such a way that the thread grips tightly along a certain arc on said gearwheels; it is held between a number of V-shaped grooves corresponding to this gripping arc, arranges itself in a zig-zag pattern on said gearwheels, and is thus drawn, under the action of friction alone, by the rotation of the set of this supply device that is composed of the two wheels described above.

By varying the axial distance between the two frontally engaging gearwheels, the opposing teeth of each pair form V-shaped grooves with different distances from the vertices of the axes of rotation of the wheels themselves, but the thread that is to be drawn is arranged tangentially to said wheel and to the projections that are arranged on the teeth of said wheels in accordance with a constant diameter of rotation. Thus, by varying the relative positions between the two wheels that comprise a supply set, a drawing effect of greater or lesser magnitude is obtained, and this varies the angle at which the thread is arranged on the zig-zag path on the teeth and thus varies the intensity of the friction.

At present, this kind of variation can be achieved only using supply devices that are of different geometries or by placing the two wheels that comprise a set different distances apart.

The intention of inventor of this invention was to provide a supply set which would solve this problem and would offer quick and flexible maneuverability without requiring the use of spacers or different supply units.

To accomplish this, he developed a supply set according to claim 1 that was composed of two like gearwheels that have shapes and geometric characteristics which make it possible to vary the axial distance between the two wheels simply by varying their relative positions just by turning them.

A more detailed description of a preferred embodiment of the invention will now be given, also referring to the attached drawings, where:

- Fig. 1 shows a sketch that indicates schematically the arrangement of the supply set according to the invention in a textile machine;

- Fig. 2 shows a front view of an example of one of the gearwheels that make up said set;
- Fig. 3 shows a cross-section of a gearwheel according to a preferred embodiment of the invention;
- Fig. 4 shows a side view of the supply set according to the invention, arranged in a first position;
- Fig. 5 shows a side view of the supply set of Fig. 4 arranged in another position that is obtained by relative rotation of the two gearwheels;
- Fig. 6 shows a schematic of the zig-zag path of the thread between the teeth on its engagement arc on the supply set in the configuration corresponding to Fig. 4;
- Fig. 7 shows a schematic of the same path of the thread on the supply set in the configuration corresponding to Fig. 5.

Fig. 1 shows how textile thread 8, which comes from a supply station 7, is wound onto a take-up bobbin 6 after being drawn by friction by a supply set 5 under the action of above-described gripping arc α . This arc can be modified using known techniques by moving a pulley 10 over an arc 11 in the direction indicated by the arrows.

Fig. 3 shows the shape of the profile, in section, of wheels 1, 1' that comprise a supply set 5 according to the invention, in which teeth 3, which are arranged at diametrically opposed positions that are shown better in Figs. 2 and 3, have two projections 3c, 3d that have different axial heights h_1 , h_2 , whereby said heights can be ≥ 0 .

Also recesses 4, which are visible in Fig. 2 and with which said projections 3c, 3d are made to mate, have differing depths p_1 , p_2 , which can be ≥ 0 and which are better depicted in Figs. 4 and 5. These latter figures also show how two wheels 1, 1' which comprise a set are arranged a certain distance apart and how they are arranged after they have completed a relative rotation that has caused projections 3d, which have a greater height h_2 , to mate with recesses 4 of lesser depth p_2 .

In accordance with the configurations depicted in Figs. 4 and 5, the thread is arranged, in its drawing arc α on supply set 5, in a zig-zag pattern between the different adjacent teeth, in the two cases following the paths indicated in Figs. 6 and 7, respectively.

As indicated, angle β that is formed by the different segments of the zig-zag varies, and consequently the drawing effect that is imparted to the thread by the set and is greater in the case shown in Figs. 4 and 6 than in Figs. 5 and 7 also varies.

As can be deduced, the diameter of the meshing arc remains constant, but the thread is always arranged tangentially to projections 3c, 3d, the distances between which and the center of rotation remain constant.

The embodiment that is described above and is shown in the figures refers to the case where n teeth 3 and an equal number of recesses 4 are both subdivided

into only two groups that have differing axial projections and, respectively, different depths, with teeth 3 and recesses 4 alternating in such a way that said two projections 3c, 3d and two recesses 4, which have differing heights h and depths p, are arranged consecutively. Other embodiments are possible, however, in which both the projections and the recesses are subdivided into a larger number of groups that have similar characteristics and dimensions, such that it is possible, by appropriately arranging the elements that constitute the different groups, to obtain a larger number of combinations of projections and recesses that can produce different configurations with different axial distances between frontally opposing wheels 1, 1'.

This produces the technical result desired by the inventor, i.e., that of providing a supply set that is composed exclusively of two like gearwheels and is able to operate under different operating conditions that can be achieved simply by rotating the two wheels to a predetermined extent and locking them in the desired position.

Claims

1. Supply set (5) for drawing textile threads (8) by means of friction, composed of two formally meshing like gearwheels (1, 1'), whose n teeth (3) are shaped with a profile that ensures that the pairs of meshing teeth (3) form a V-shaped groove (9) that is open toward the outer circumferences of said wheels (1, 1') themselves, whereby said teeth (3) have projections (3c, 3d) such that said groove (9) is able to hold within itself, tangentially to said projections (3c, 3d), a textile thread (8), drawing it by means of friction under the action of the rotation of the wheels (1, 1'), characterized in that the projections (3c, 3d) on the teeth (3) of each wheel (1, 1') extend axially at different predetermined heights (h1, h2) and are able to mate with an equal number of recesses (4) in the opposing wheel, the recesses (4) having depths (p1, p2) which are greater than or equal to zero and which are complementary to said heights, such that, by carrying out a relative rotation of said wheels (1, 1') one or more axial distances are obtained between the different wheels (1, 1').
2. Supply set according to claim 1, wherein the heights of the projections (3c, 3d) are greater than or equal to zero.
3. Supply set according to claim 1, wherein the recesses (4) are holes that go through.
4. Supply set according to one of claims 1-3, wherein in each wheel (1, 1') the teeth (3) and the recesses (4) alternate in such a way that two teeth (3) and two recesses (4) for which said projection heights and recess depths, respectively, are different turn

out to be consecutive.

Patentansprüche

1. Zuführeinheit (5) zum Ziehen von Textilfäden (8) mittels Reibung, bestehend aus zwei formschlüssig miteinander kämmenden, einander entsprechenden Zahnrädern (1, 1'), deren n Zähne (3) mit einem Profil ausgebildet sind, das sicherstellt, daß die Paare kämmender Zähne (3) eine V-förmige Rille (9) bilden, die in Richtung des äußeren Umfanges der Räder (1, 1') selbst offen ist, wobei diese Zähne (3) Vorsprünge (3c, 3d) aufweisen, so daß die Rille (9) in der Lage ist, in sich tangential zu den Vorsprüngen (3c, 3d) einen Textilfaden (8) zu halten und ihn mittels Reibung unter der Wirkung der Drehung der Räder (1, 1') zieht, dadurch gekennzeichnet, daß sich die Vorsprünge (3c, 3d) auf den Zähnen (3) jedes Rades (1, 1') axial in verschiedene vonbestimmte Höhen (h1, h2) erstrecken und in eine gleiche Anzahl entsprechender Rücksprünge (4) in dem gegenüberliegenden Rad eingreifen können, wobei die Rücksprünge (4) Tiefen (p1, p2) aufweisen, die größer oder gleich Null sind, und welche zu den Höhen komplementär sind, so daß durch Ausführen einer relativen Drehung der Räder (1, 1') ein oder mehrere axiale Abstände zwischen den verschiedenen Rädern (1, 1') erreicht werden.
2. Zuführeinheit nach Anspruch 1, dadurch gekennzeichnet, daß die Höhen der Vorsprünge (3c, 3d) größer oder gleich Null sind.
3. Zuführeinheit nach Anspruch 1, dadurch gekennzeichnet, daß die Rücksprünge (4) Durchgangslöcher sind.
4. Zuführeinheit nach einem der Ansprüche 1 bis 3, dadurch gekennzeichnet, daß bei jedem Rad (1, 1') die Zähne (3) und Rücksprünge (4) sich so abwechseln, daß zwei Zähne (3) und zwei Rücksprünge (4), deren Vorsprungshöhen bzw. Rücksprungstiefen unterschiedlich sind, aufeinanderfolgen.

Revendications

1. Ensemble fournisseur (5) pour tirer des fils textiles (8) par friction, composé de deux roues dentées (1,1') identiques et engrénant formellement, dont les n dents (3) ont un profil qui assure que les paires de dents en engrènement (3) forment une gorge en forme de V (9), qui est ouverte vers les circonférences extérieures des dites roues (1,1') elles-mêmes, de sorte que les dites dents (3) comportent des saillies (3c, 3d) de telle façon que la dite gorge (9) est capable de maintenir à l'intérieur

d'elle-même, tangentiellement aux dites saillies (3c, 3d), un fil textile (8), en l'entraînant par friction sous l'action de la rotation des roues (1, 1'), caractérisé en ce que les saillies (3c, 3d) sur les dents (3) de chaque roue (1, 1') s'étendent axialement selon des hauteurs prédéterminées différentes (h1, h2) et sont capables de correspondre à un nombre égal de creux (4) ménagés dans la dent opposée, les creux (4) présentant des profondeurs (p1, p2) qui sont supérieures ou égales à 0, et qui sont complémentaires des dites hauteurs, de telle façon que, en effectuant une rotation relative des dites roues (1, 1'), on obtient une ou plusieurs distances axiales entre les différentes roues (1, 1').

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2. Ensemble fournisseur selon la revendication 1, dans lequel les hauteur des saillies (3c, 3d) sont supérieures ou égales à 0.
3. Ensemble fournisseur selon la revendication 1, dans lequel les creux (4) sont des trous traversants.
4. Ensemble fournisseur selon l'une des revendications 1-3, dans lequel dans chaque roue (1, 1') les dents (3) et les creux (4) alternent de telle façon que deux dents (3) et deux creux (4) pour lesquels les dites hauteurs de saillie et profondeurs de creux sont différentes, respectivement, se trouvent être consécutifs.

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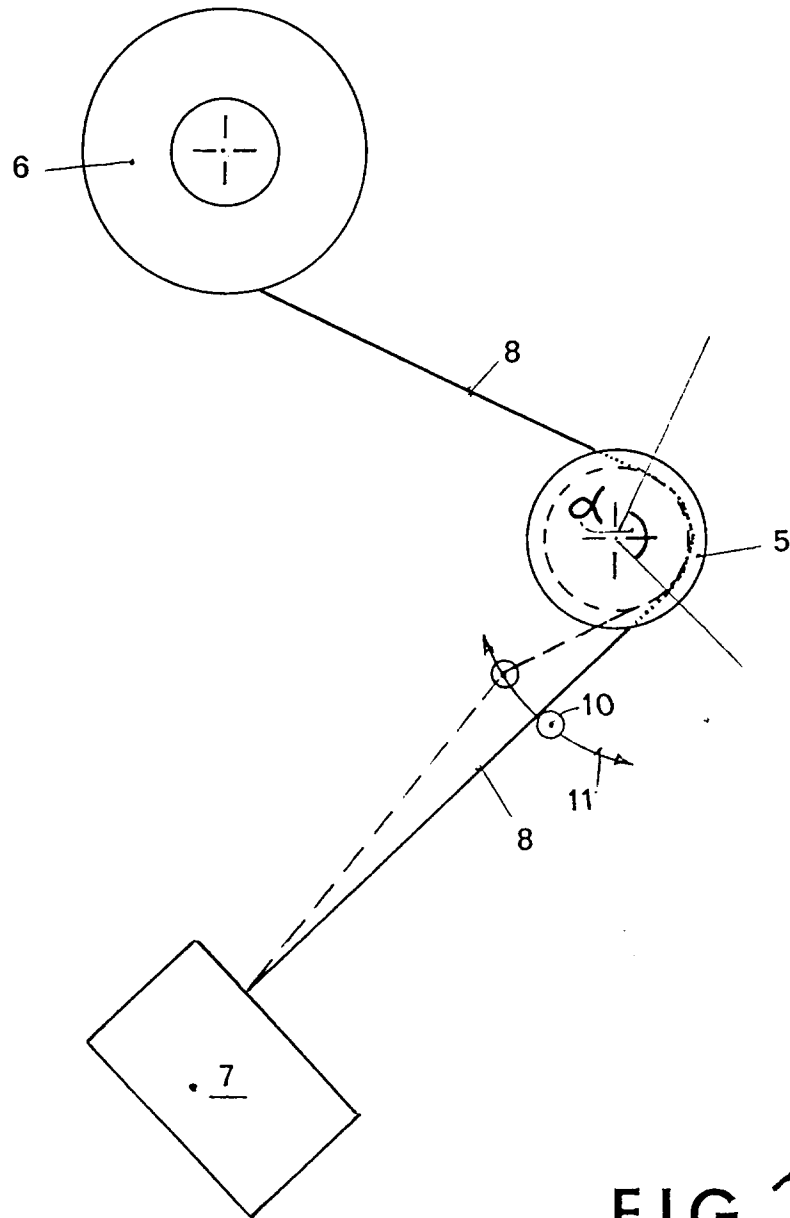


FIG.1

FIG.3

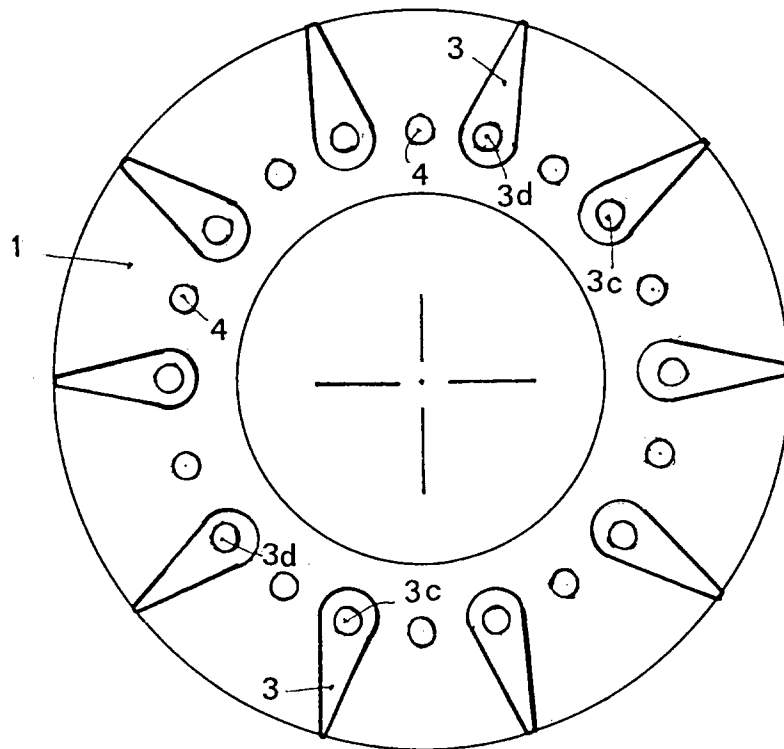
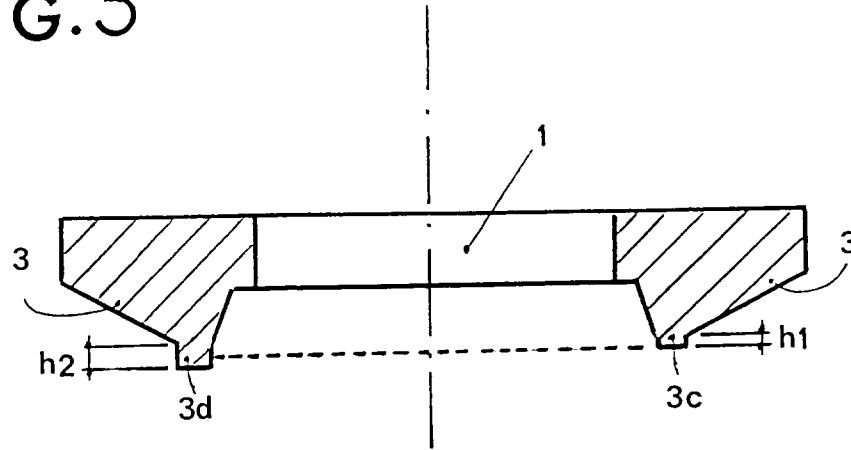


FIG.2

FIG.4

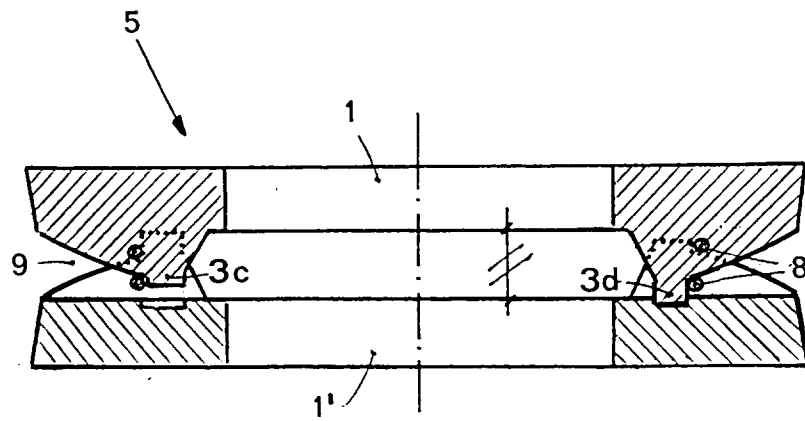
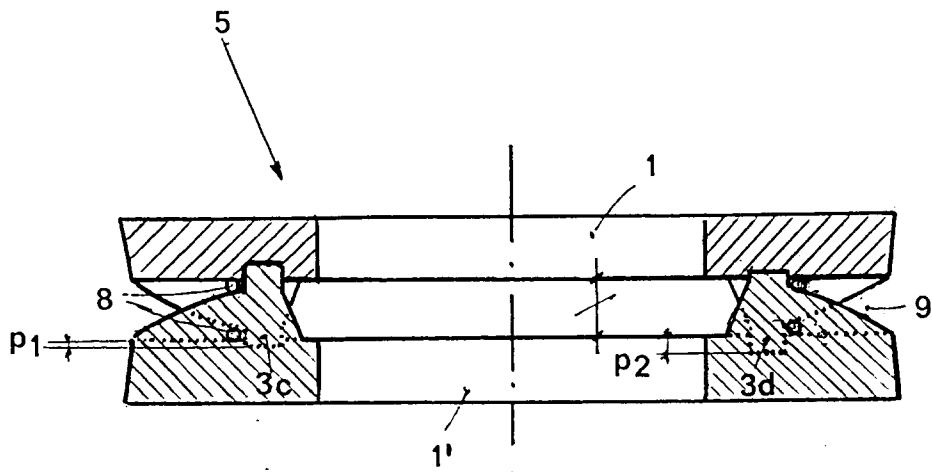


FIG.5

FIG. 7

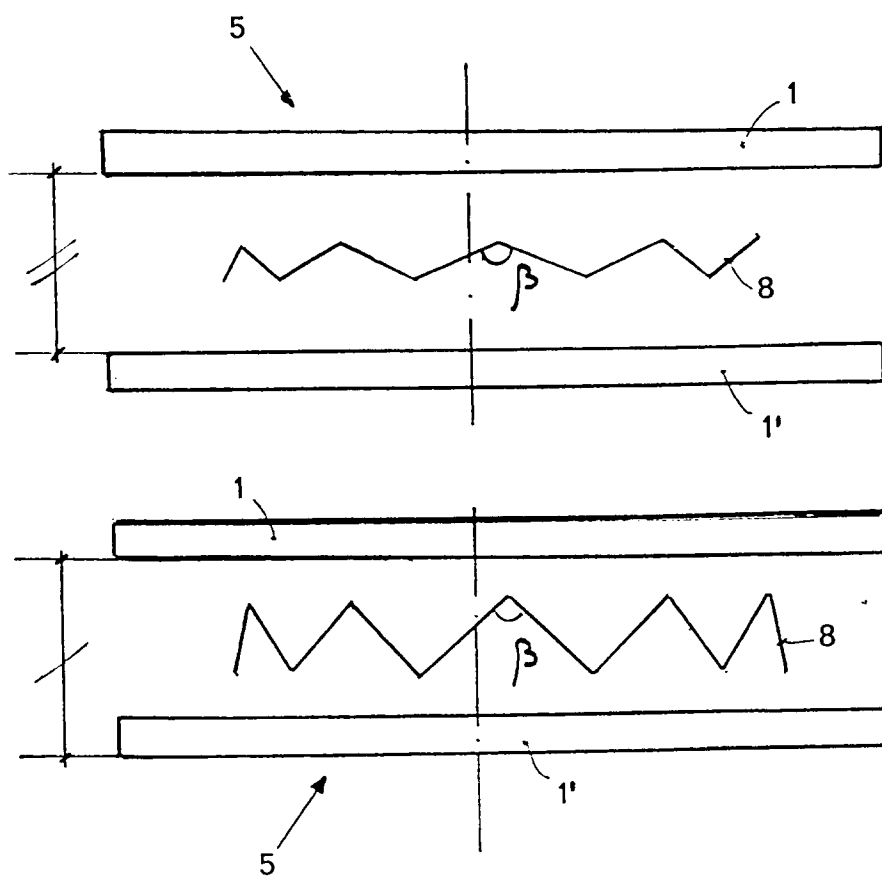


FIG. 6