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(12) # EUROPEAN PATENT APPLICATION

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(54) **A stripping roller for drawing fibres to be fed to so-called "open-end" spinners, with inclined drawing teeth alternated with discharging teeth.**

(57) A stripping roller (19) for drawing fibres (11A) from a tops or feeding sliver (11) for open-end spinners, in which the teeth, which are circumferentially out-of-alignment, are formed on the outer periphery of laminar flexible rings (50) mounted uniformly spaced apart by spacers which have constant thickness and which are deformed with respect to the planar shape, i.e. "twisted" by means of two annular end elements provided with facing complementary shaped surfaces, the rings having inclined drawing teeth, i.e. hooking teeth which are alternated with discharging teeth having opposite inclined profile.

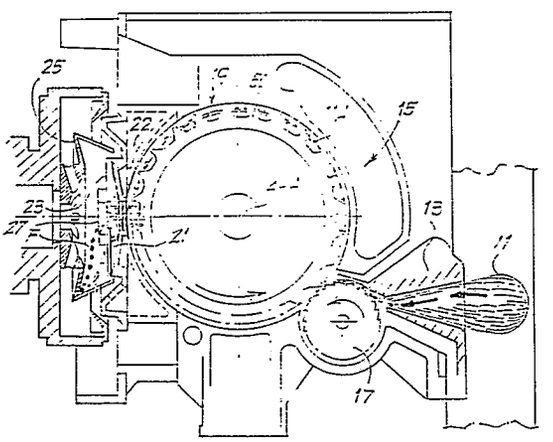

FIG.2

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Description

A STRIPPING ROLLER FOR DRAWING FIBRES TO BE FED TO SO-CALLED "OPEN-END" SPINNERS, WITH INCLINED DRAWING TEETH ALTERNATED WITH DISCHARGING TEETH

The invention refers to so-called "open-end" spinning groups, wherein there is provided to supply a tops, i.e. a fiber sliver from which the fibers are drawn and heavily thinned by a so-called spiked stripping roller, i.e. a roller with tooth clothing for individualizing the fibres which are delivered to a condenser form which they are drawn substantially parallelized, in order to be subsequently twisted. Currently, the stripping rollers have all the teeth inclined or anyway shaped so as to form "drawing teeth", which tend to hook, i.e. to grip the fibres and retain them for having them driven along by the rotation of the stripping roller; in this way, the fibres also tend to become bound to each other and to the clothing.

The stripping roller with the teeth of its clothing must pick up the fibres material by means of teeth that must extend across the whole width of the group of fibres of the tops which is fed to the periphery of the stripping roller, and the drawing has to be uniform over the whole front to obtain regularity of feeding. The stripping roller may be formed with a helical channel, wherein there is fitted a toothed band which has projecting teeth forming the clothing of the stripping roller; by the rotation of the stripping roller there is, of course, a uniform drawing over the whole front width of the tops which is fed, but the stripping rollers built in this way have a relatively very short life (especially with the use of certain synthetic fibres) because the teeth of the stripping roller tend to wear out at well defined locations, and this leads to a rapid etching of the front edge of the teeth with the conseguent risk of fibres retention and anyway with irregularity of feeding which, beyond certain limits, causes irregularity in the production of the yarn, and even the need to replace the clothing and thus the stripping roller. The hardening of the band material must be limited to the teeth zone, and this reduces the efficiency of the hardening itself, while the base of the band must be sufficiently plastic to allow for its mounting. According to another embodiment, the stripping roller is provided with a series of radial holes wherein the single teeth are fitted and blocked; this causes - besides the cost and the significant weight of the stripping roller - also difficulties in the delivery owing to the presence of cavities and recesses which tend to anchor the fibres. The stripping rollers of the above mentioned types, and those of other types currently known, have also the drawback of a remarkable formation of dust, i.e. of small and very short fibres, which demand frequent interventions for the cleaning of the spinning heads and cause also irregularity in the production of the yarn. According to further solutions, the stripping roller is formed with laminar, flexible rings, with the teeth being formed at the outer periphery of said rings, which are mounted uniformly spaced apart and deformed with respect to the planar shape, i.e. "txwisted"; this is achieved, in practice, by forming an alternate pile of said laminar toothed rings and of deformable spacers rings whose outer diameter is not greater than the diametral dimension of the bottom of the recesses between the teeth; the clamping at the ends of said pile is provided by two annular end elements with facing front surfaces which are complementary shaped, to achieve the deformation, i.e. the twisting of said laminar rings and of said spacer rings. The deformation or "twisting" of said laminar toothed rings must be at least equal to the thickness of the spacer rings. The laminar rings with outer toothing are hardened over the whole extent of the material.

In the stripping rollers presently known, regardless of their embodiment, the teeth are all formed for hooking up the fibres. This brings about, in certain cases, some known drawbacks which are overcome by the present invention.

Substantially, a stripping rollers for the drawing of fibres from a tops or feeding sliver for open-end spinners, with teeth formed by a laminar element is characterized, according to the invention, in that the drawing teeth, which are formed with a front profile heavily inclined with respect to the tangent and even forwardly and outwardly inclined, are alternated with discharging teeth with a front profile backwardly and outwardly inclined, having a discharging function.

In a particular embodiment of the invention, the teeth may be formed on the outer periphery of laminar flexible rings; said rings are mounted uniformly spaced apart and deformed with respect to the planar shape, i.e. "twisted", and the drawing teeth are alternated with dicharging teeth.

In practice, a discharging tooth may be alternated with a drawing tooth.

Advantageously, the discharging teeth may be formed by opposite symmetrical profiles.

The end profiles of the discharging teeth may be rounded.

The invention will be better understood by following the description and the attached drawing, which shows a practical, non limiting embodiment of the invention. In the drawing:

Figs.1 and 2 show diagrammatically an "open-end" spinning head;

Figs.3 and 4 show stripping roller in a front view and in an exploded view;

Figs.5 and 6 show a laminar toothed ring and an end annular element as viewed on line V-V and VI-VI of Fig.4; and

Fig.7 shows an enlarged detail of Fig. 4.

A particular spinning apparatus of a so-called "open-end" spinner is shown in Figs.1 and 2. The fibres sliver 11 coming from the sliver can is conveyed to a condenser 13 and then fed to the thinning group 15, comprising a feeding roll 17 and a roller with toothed clothing, i.e. a stripping roller 19 for thinning, i.e. individualizing the fibres. The fibres so drawn and thinned, indicated by 11A, are let into an opening 21 forming a mouthpiece in a fixed wall

22, which opening leads behind a separator 23 (of any suitable shape), which separates the opening 21 for the inlet of the fibres from the spinning chamber, formed by a rotor or turbine 25, which defines an annular groove. The fibres are conveyed into the spinning chamber and taken away therefrom in the form of a yarn F - which has been subjected to the necessary twist - through an axial passageway 27 and along a withdrawal tube 29.

According to the drawing, the stripping roller is made up of a set of metallic laminar rings 50 which are externally toothed with teeth 51 and 52 which will be described in detail later on. These rings are hardened and are flexible in order to be mounted sufficiently twisted with respect to a geometrical plane perpendicular to the axis of the stripping roller 19, the deformation, i.e. the twisting relative to said geometrical plane of regular lay being of an extent at least equal to the spacing provided between two subsequent and adjacent rings. The toothed metallic rings 50 are mounted on a core 53 to form a pile with the interposition of spacer rings 54 of flexible material such as, in particular, synthetic resin; the pile of rings 50 and 54 is completed by two annular end elements 56 which are of non uniform thickness and positioned in a complementary way one with respect to the other; in this way the pile of rings 50 and 54, completed with the two annular end elements 56, makes up a pack of uniform thickness which is clamped between two flanges 58 and 60 which make part of the rotating unit of the stripping roller. By clamping the pile of rings 50, 54, the latters are twisted with respect to the respective lying planes perpendicular to the stripping roller axis indicated by A-A, owing to the variation of thickness of the annular end elements 56 - the position of the two annular end elements 56 being such as to have a complementary variation -, and the twisting is at least equal to the interspace between two contiguous rings 50, 50, i.e., at least equal to the thickness d of the spacer rings 54.

The rings 50 may be easily subjected to a hardening and quenching treatment which is very efficient in improving the life of the teeth, and they may also be easily replaced.

As already stated, the stripping roller 19 provided in the "open-end" spinning unit is intended for thinning at 11A the fibres coming from sliver 11 - called "tops" - to insert them into the rotor formed by member 25; the fibres inserted into the rotor must also be straight and parallelized. The transfer of the fibre is accomplished by a suction generated by the rotor through several peripheral holes. The fibres which are sucked in this way are arranged into the annular edge-like cavity of the rotor to get bound afterwards by a twist obtained through an axial recall, thereby forming the yarn F.

Each ring 50 is provided with teeth 51 for the drawing, i.e. for the hooking of the fibres, and teeth 52 for the discharging thereof, which in the drawing are alternated in a 1:1 arrangement, but which could be alternated in a different way, for example, with two drawing teeth 51 and one discharging tooth 52. The drawing teeth 51 have the front edge 51A - relative to the direction of rotation - which is slightly inclined outwardly and forwardly, with respect to the radial direction A-R, for example of about 5°; these teeth 51 are able to hook the fibres of tops 11, delivered by condenser 13 and by roll 17, thereby thinning them. The discharging teeth 52 are substantially symmetrical and tapered and have, anyway, the front edge 52A which is inclined outwardly and backwardly, that is, in opposite direction with respect to the edges 51A. These discharging teeth 52 have various functions. In the first place, these teeth 52 do not hook the fibres so that the fibres do not tend to get bound thereto as they do, instead, on the teeth 51. In the second place, the profiles 52A tend to raise the fibres outwardly rather than urging them towards the base of the tooth as it happens, instead, with the teeth 51; consequently, the teeth 52 facilitate discharging of the fibres from the stripping roller and their suction therefrom by the rotor member of the "open-end" spinner. In the third place, the teeth 52 tend to comb the fibres and parallelize them, thereby improving the quality of the yarn F thus obtained. The stripping rollers provided with the above mentioned discharging teeth 52 do not tend to become filled with fibres, so that they do not tend to become clogged, and they demand a maintenance far more limited than the usual stripping rollers. Other objects and advantages will be evident to those skilled in the art. The yarn thus produced is uniform, the cleaning of the rotors is almost unnecessary or, anyway, to be carried out at very long intervals.

Claims

1. A stripping roller for drawing fibres form a tops or feeding sliver for open-end spinners, having teeth formed by at least one laminar element, characterized in that the drawing teeth, formed with a front profile heavily inclined to the tangent and even outwardly and forwardly inclined, are alternated with discharging teeth with the front profile inclined backwardly and outwardly and having a discharging function.

2. Stripping roller according to the preceding claim, characterized in that drawing teeth alternated with discharging teeth are formed on the outer periphery of a set of laminar flexible rings, said rings being mounted uniformly spaced apart from one another and deformed with respect to the planar shape, i.e. "twisted"

3. Stripping roller according to claim 1 or 2, characterized in that a discharging tooth is alternated with a drawing tooth in a 1:1 relationship.

4. Stripping roller according to any of the preceding claims, characterized in that the discharging teeth are formed with opposite symmetrical profiles.

5. Stripping roller according to any of the preceding claims, characterized in that the diascharging teeth have a rounded end profile.

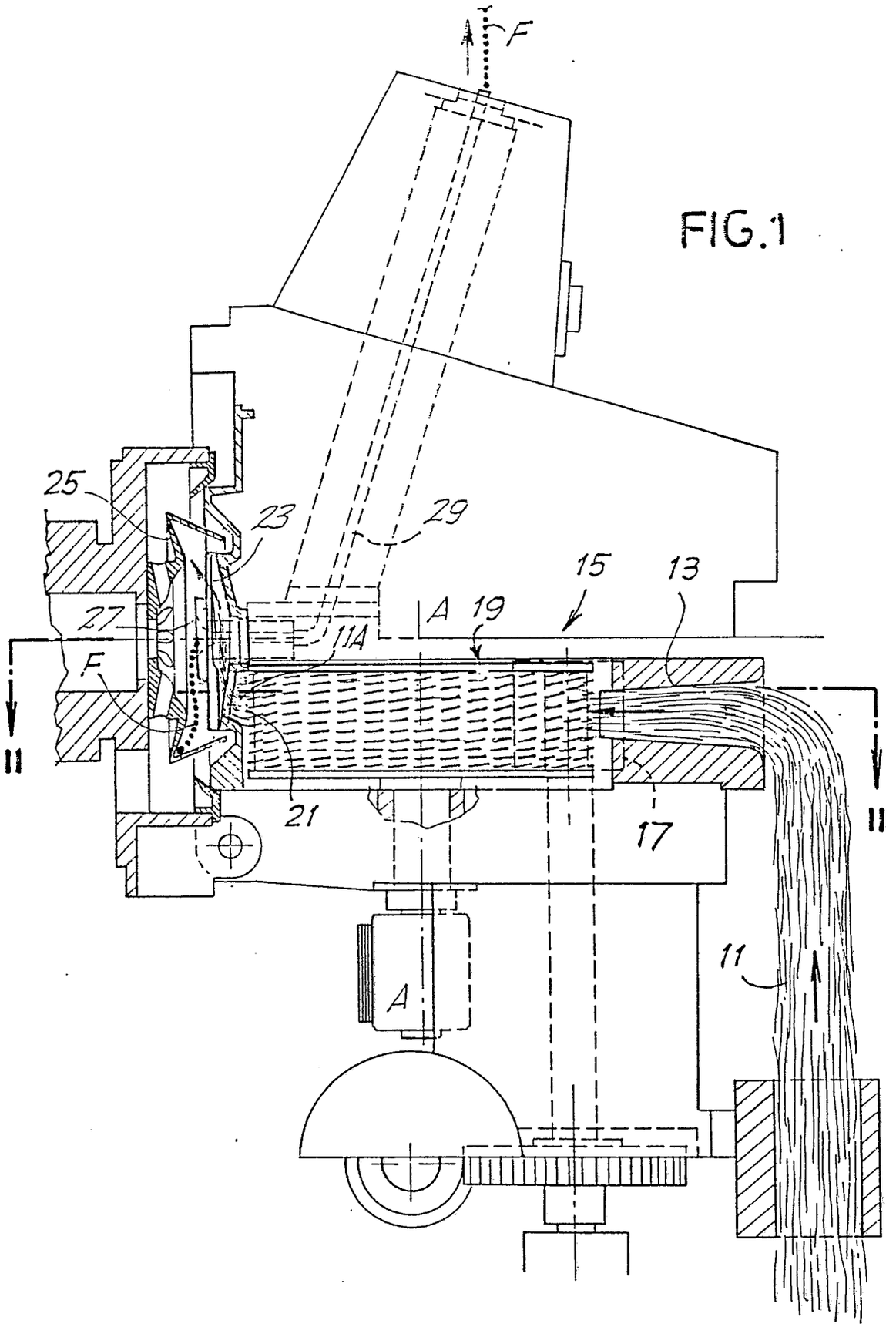


FIG.1

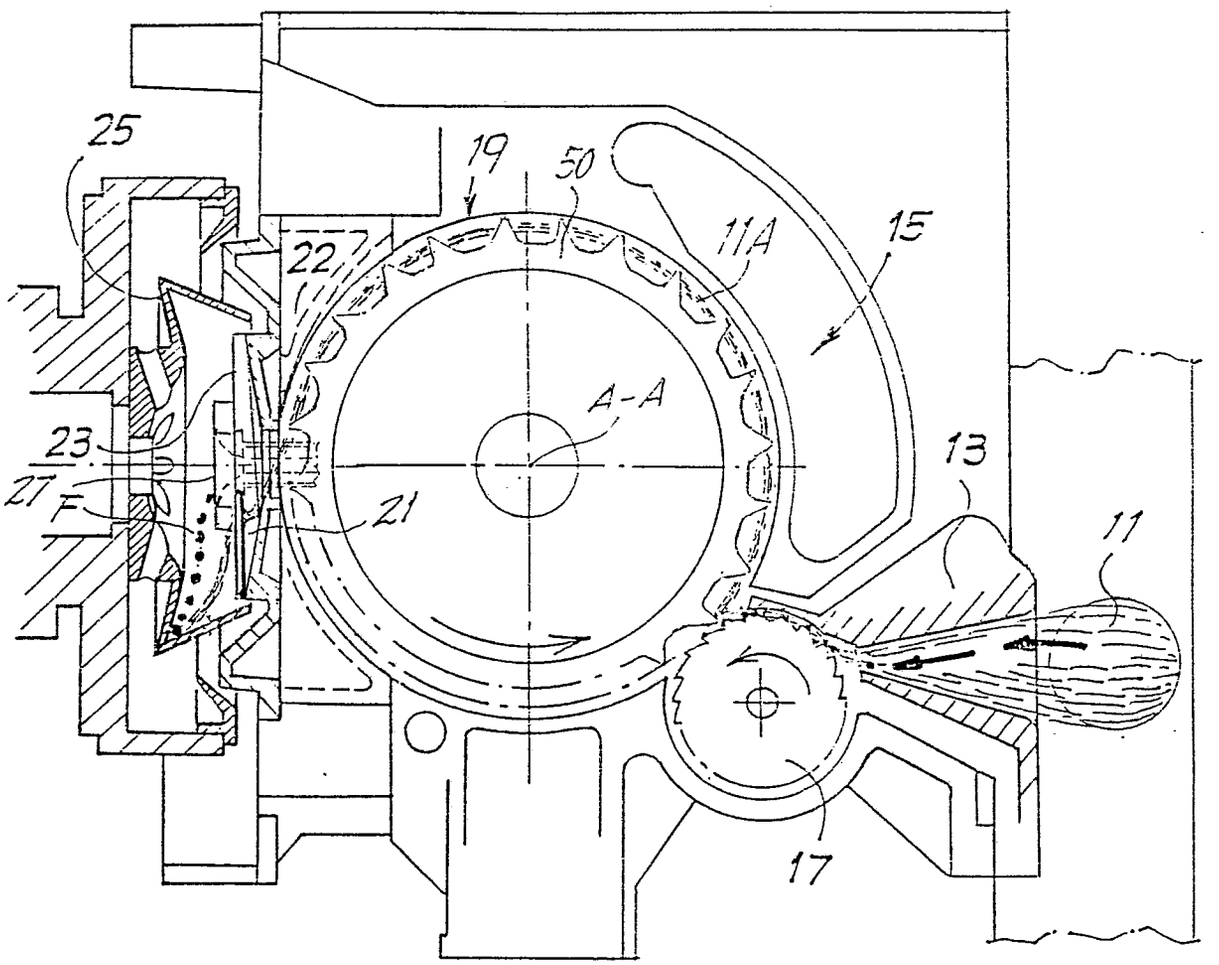
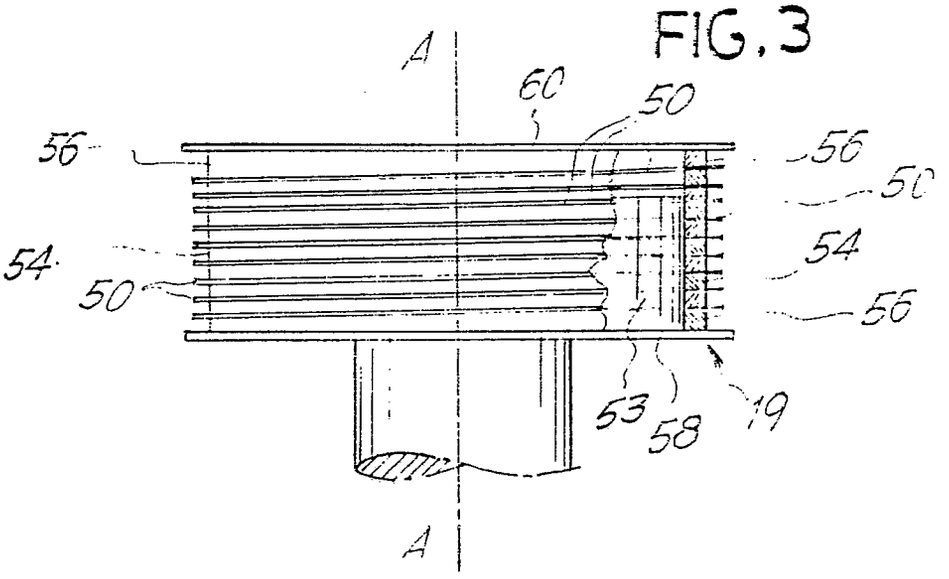


FIG.2

FIG. 3


A
60
50
56
56
50
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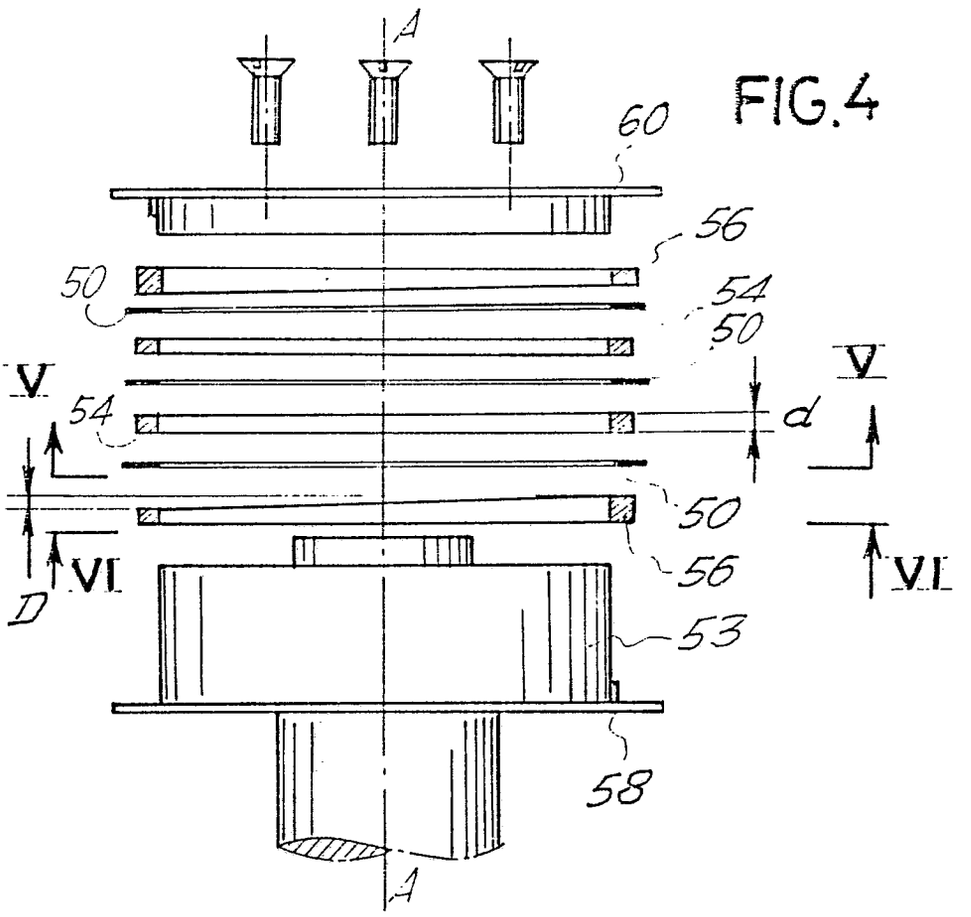
56
53
58
19
A

FIG. 4


A
60
56
50
54
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V
V
54
d
50
56
VI
VI
D
53
58
A

FIG.5

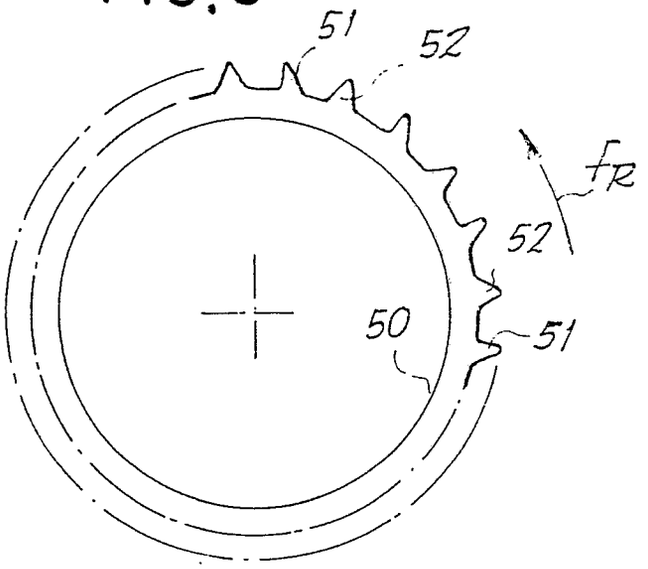


FIG.6

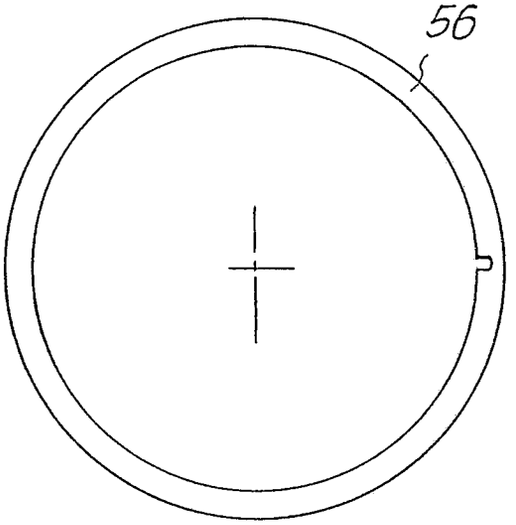
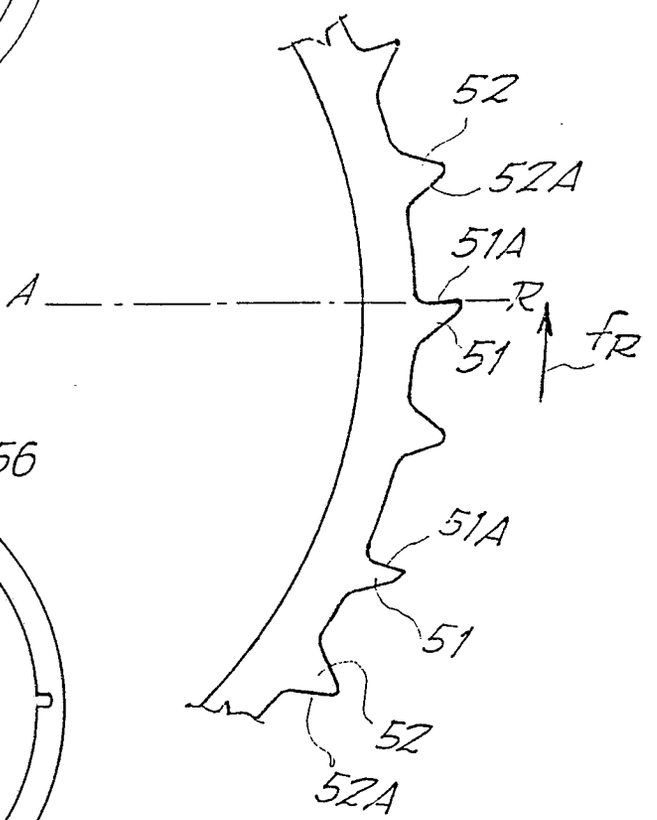


FIG.7



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EUROPEAN SEARCH REPORT

Application Number

EP 89 83 0370

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	GB-A-2165561 (PATENTES PLATT SA) * page 1, lines 95 - 120; figures 8, 9 *	1	D01H4/32
A	BE-A-706460 (G. ROTSAERT) * page 5, lines 11 - 22; figures 1, 2 *	1	
A	GB-A-2073267 (SOCIETE ALACIENNE DE CONSTRUCTIONS DE MECHANIQUES DE MULHOUSE) * claim 1; figure 7 *	1	
A	JP-A-4819727 (...) * figure 3 *	1, 2	
A	EP-A-154116 (ALLIED CORP.) * page 5, lines 25 - 30; figures 3A, 3B *	1	
A	EP-A-209008 (BRÄCKER AG)		
A	EP-A-142073 (STAEDTLER & UHL)		

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

D01H
D01G

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	30 NOVEMBER 1989	HOEFER W.D.

CATEGORY OF CITED DOCUMENTS

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