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(54) **Guide device for core yarns applied in corespun yarns**

(57) The device comprises a set of separate, adjacent pivoting arms (5,5',3,3') for each adjacent guide roller (1,1') for lapping filaments, said arms (5,5',3,3') being mounted with independent rotation capability and stable positioning at variable angles, on a support (8) which is fixed adjustably on a single rail (10) on which are also fixed the roving guides, also adjustably, said support (8) being connected to a fixed part of a spinning machine, by means of a resilient arm (17) provided with flexion capability in a horizontal plane.

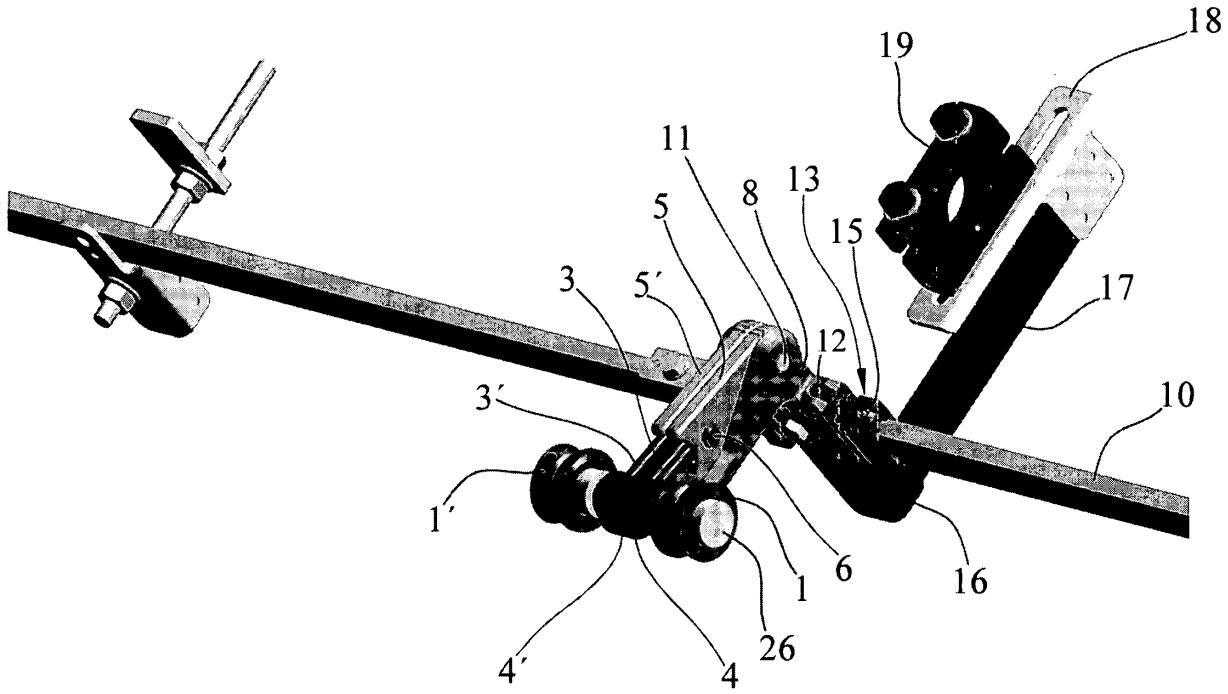

FIG.1

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Description

[0001] The present invention relates to a high-precision multi-function guide device for the lapping of yarns, that affords many advantages over what is currently known.

[0002] The guide device according to the present invention applies to monofilaments, multifilaments, elastomers and various yarns which, for greater simplicity will be referred to simply as filaments, towards the centre or edges of the bundle or bundles of fibres emerging from a draw-frame of a spinning machine to cause them to lap one another. This technology is eventually known for elastic thread, stretch yarn, rigid core spun, elastic core spun, rigid siro spun, elastic siro spun, net, braid and others.

[0003] The currently known devices have various drawbacks both in handling and adjusting the filament guide rollers. In addition, it is not easy to achieve periodic lateral movement of the guide devices so as to vary the point of incidence of the threads and reduce local wear.

[0004] The present invention relates to a new high-precision guide device with reciprocating movement that can easily be automated to lap yarns or filaments in spinning frames and that allows all the problems and drawbacks referred to above to be resolved satisfactorily.

[0005] Basically the present invention starts from the structure of adjacent guide rollers which are conventional in lapping devices, are mounted on mutually independent arms and can assume stable adjustment positions independently of each other and at the same time said arms are mounted with great precision on a single support that simultaneously carries the roving guides and that, by means of a resilient arm or spring, allows the assembly to be connected to a fixed part of the machine. By this arrangement, various problems are resolved simultaneously. Firstly, by fixing the assembly with a resilient support or spring the device can easily be adapted to any of the automated movement systems for the lapping guides that exist at present, secondly, the precise connection in a single support or common rail of the roving guides and the supports and the supports of the arms carrying the rollers allows fixed adjustment of the position of the rollers and the roving guides to be achieved since lateral drift does not occur.

[0006] As an explanatory but not limiting example, to assist understanding of the invention, the accompanying drawings illustrate a preferred embodiment of the invention.

[0007] Fig. 1 is a perspective view of an assembly of two arms carrying rollers with their supports integrated in a single rail support, all of which is integrated in a resilient arm or spring that supports the assembly in relation to the fixed part of the machine.

[0008] Fig. 2 is a perspective view on a larger scale of the assembly with two pivoting arms and their respective rollers.

[0009] Fig. 3 is a view similar to Fig. 1 and illustrates the roller-carrying arms in different rotational positions.

[0010] Fig. 4 is a perspective view of a simple roving guide.

[0011] Fig. 5 is a perspective view of a double roving guide.

[0012] The device according to the invention comprises in its assembly the guide rollers -1-, -1'- mounted with the respective bearings -26- on each axis of the roller -1-, each being connected by parts -4- and -4'-, preferably of injected moulded plastics material, to corresponding arms -3- and -3'-, which are each fixed to levers -5- and -5'- which are independent of each other and can be handled without hindering the spinning process of the contiguous position since they can rotate on a transverse axis or pivot -11- in a body -8- fixed to the single rail -10- by means of screws -12-. This single rail -10- is connected by the support -16- to a resilient arm or spring -17- which will be incorporated, by a support -18- and the upper clamp -19-, in a rod or fixed tubular component of the spinning machine.

[0013] The rail -10- itself carries the roving guide -13-. An example of an individual roving guide has been illustrated in Fig. 1, and Fig. 5 is an illustration of a double roving guide.

[0014] According to the present invention, the lever -5-, the body -8- and the pivot -11- are constructed with very narrow tolerances so that the corresponding guide roller -1- has no play, principally no lateral play, which is one of the most important conditions that must be guaranteed by means of the device, in other words, that the filament and the fibres should be perfectly aligned and should maintain said alignment permanently. According to the present invention, the body -8- has extended wings to guide the lever -5- laterally, all of which provides available space in the spinning machine to get close to the centre of the rotating guide roller -1-.

[0015] As can be seen in Figs. 2 and 3, the levers -5- and -5'- each have grooves -9- and -9'- to allow different stable radial positions to be achieved in relation to the corresponding guide bodies -8- and -8'- and each has smooth areas as illustrated by reference numeral -27- in Fig. 3. It is thus possible for each guide roller -1-, -1'- to rest freely on the upper roller of the draw-frame, while each of the levers -5- and -5'- can be held at an angle at the desired height by the combination of the grooves -9- and -9'- with a spring -7- which has been shown clearly in Fig. 3 and which, when held in the support, interacts with the sets of grooves -9- and -9'-. Thus, each of the levers -5- and -5'- remains in the position selected by the operator, who can have both hands free to thread the filaments and perform the necessary handling operations for the production process.

[0016] The bodies -8- and -8'- are integral with a frame -28- provided with apertures, such as -29-, to allow connection to a single support rod or rail -10- and at the same time, by means of an intermediate support -16-, to the resilient arm or spring -17- fixed to the support -18- carrying the clamp -19-.

[0017] The roving guides, such as the roving guide -13- illustrated in Fig. 1, are also fixed to the rail -10-, and thus both the guide rollers -1-, -1'- and the roving guides are fixed to the same support rail, so that once the rollers -1- and -1'- have been centred by their corresponding screws, only one of which has been illustrated in Fig. 2 by reference numeral-14-, the roving guides, for example, the roving guide -13- which is fixed by means of the screw -15-, allows the fibre filaments to remain perfectly aligned by being held in a common component, which is said rail -10-.

[0018] It should be borne in mind that in current systems the rotating guide roller is fastened to the arm of the draw-frame which has a large amount of lateral play and the roving guide is fixed to an independent rail of said arm. Therefore since there are filaments and rovings guided by parts with a large amount of lateral play that are not fastened to a common component, there is no guarantee that the filament and roving are aligned, which is one of the important advantages of the present invention. Depending on the type of lapping or spinning system, the filaments and rovings must have a certain distance between centres instead of being aligned, but once this distance has been adjusted, it must remain invariable. In short, through the present invention it is possible to:

- Fix the bodies carrying the levers fixing the rollers to the single support or rail -10-, in the example illustrated, by means of the screws -12-.
- Fix the rotating guide rollers -1- and -1'- on their axis by means of the corresponding screws.
- Fix the roving guides on the rail -10- by means of the screws, -15-, in the example illustrated.

[0019] By means of the device according to the invention it is possible to carry out all the adjustments needed for different types of lapping and conventional spinning systems or with condensing systems for spinning with less hairiness and the design and dimensions allow adjustments to be made without the components of the draw-frame interfering with each other.

[0020] In the example illustrated in Fig. 1, the roving guide -13- has only one guide or passage, its structure being shown in detail in Fig. 4, in which it can be seen that said roving guide -13- can be fixed to the rail by means of the screw -15- and has a passage -20- for the passage of the rail -10-, having also a passage for guiding the roving that has an enlarged entrance -21- and exit -22-. It will also be possible to provide double, triple or a larger number of roving guides. In Fig. 5 the roving guide -23- has been shown with the two passages indicated by the numbers -24- and -25-.

[0021] The draw-frames of spinning machines known at present have roving guides fixed to a rod connected in spans along the whole length of the machine, this rod having an integrated automatic system to provide reciprocating movement so that the rovings or bundles of fibres change position since they are moved by conveyor belts of leather or synthetic materials with rollers also covered in synthetic rubber. This reciprocating movement is designed to ensure that the rovings or bundles of fibres do not always run through the same place producing uniform wear and avoiding grooves in the contact components.

[0022] Most devices for guiding filaments do not have automatic mechanisms to allow the movement trajectory of the filament to be varied. They only have manual solutions with high handling costs. In addition, the automatic reciprocating mechanism of the roving guides must be eliminated and replaced by a mechanism, also manual, since the filament and the rovings or bundles of fibres must be well aligned. In addition to the cost of performing the manual process, there is a risk of errors on moving the filament to one side and the roving or bundle of fibres in the opposite direction by a different magnitude.

[0023] The present invention is characterised, as has been shown above, in that a single rail -10- incorporates the roving guides -13- and the rotating rollers -1-, -1'-, being fixed by the support -16- to the rail -10- to a resilient arm -17- or spring that in turn is held by the support -18- and carries the clamp -19- for fixing to a fixed component of the draw-frame, for example, the arm-carrying rod or other components. Said resilient arm or spring -17- makes it possible for the rail -10- to have reciprocating movement without friction and without the use of mechanised parts, such as bolts, bushes, guide components, etc. Therefore any of the existing automatic reciprocating mechanisms in conventional spinning machines can be connected to the rail -10-, and will thus have a guide device for filaments and rovings or bundles of fibres with automatic reciprocating movement, which does not exist at present.

[0024] In short, the present invention, since it incorporates a common guide component formed by the rail -10-, allows the roving guides -13- and the rotating guide rollers -1- and -1'- to maintain unvarying alignment of the rovings or bundles of fibres in relation to the lapping filament. It also provides:

- A construction with very narrow tolerances in the assembly formed by the levers -5- and -5'- and body -8-, -8'- and pivot -11- so that the rotating rollers have no lateral play and maintain unvarying alignment in relation to the roving guides.
- By incorporating independent levers -5-, -5'- for the rotating guide rollers -1-, -1'-, the possibility of raising one from the other independently to allow the various manipulations of the spinning process.
- A single resilient arm or spring arrangement to retain the rail -10- which allows the use of automatic reciprocating mechanisms for spinning machines in spinning systems, avoiding the manual systems known at present.

[0025] The automatic reciprocating movement will be

absolutely reliable in positioning the filament guide rollers -1- and -1'- in relation to the roving guides because since both are connected to a single component, the rail -10-, and this is fixed to a single automatic reciprocating mechanism no errors can occur either in the direction of movement or in the magnitude thereof as occurs in the manual mechanisms known at present.

[0026] Although the present invention has been described with reference to a particular embodiment thereof, it will be understood that many variations may be introduced in the devices shown and illustrated without departing from the scope of the present invention defined by the accompanying claims.

Claims

1. Guide device for lapping yarns, **characterised in that** it comprises a set of separate, adjacent, pivoting arms for each roller guiding the adjacent lapping filaments, said arms being mounted with independent rotation capability and stable positioning at variable angles, on a support which is fixed adjustably on a single rail on which are also fixed the roving guides, also adjustably, said support being connected to a fixed part of a spinning machine, by a resilient arm provided with flexion capability in a horizontal plane.

2. Guide device for lapping yarns, according to claim 1, **characterised in that** each of the pivoting arms carries the corresponding axis of a filament guide roller, by means of an intermediate part injection moulded from a synthetic material and has means for fixing it in a stable manner in different angular positions so that the operator can have both hands free.

3. Guide device for lapping yarns, according to claim 1, **characterised in that** the axis set carrying the filament guide roller, and also the levers and fixing supports to the rail carrying the roving guides are connected so as to prevent lateral movement of the roving guides and the filament guide rollers, allowing the initial position adjustment to be maintained.

4. Guide device for lapping yarns, according to claim 1, **characterised in that** the rail that adjustably receives the arms carrying the yarn-guide rollers and the roving guides has means for connection to a reciprocating movement device of a spinning frame machine.

5. Guide device for lapping yarns, according to claim 1, **characterised in that** the rail on which are adjustably fixed both the arms of the filament guide rollers and the roving guides pivots in a horizontal plane by the oscillation of the resilient arm for fixing to the fixed components of the spinning machine with simultaneous connection of the rail to the reciprocating movement device of the spinning machine.

6. Guide device for lapping yarns, according to claim 1, **characterised in that** the means of stable fixing in the angular position consists of sets of transverse grooves in the articulation areas of the pivoting arms combined with a retention spring mounted on the support of said arms.

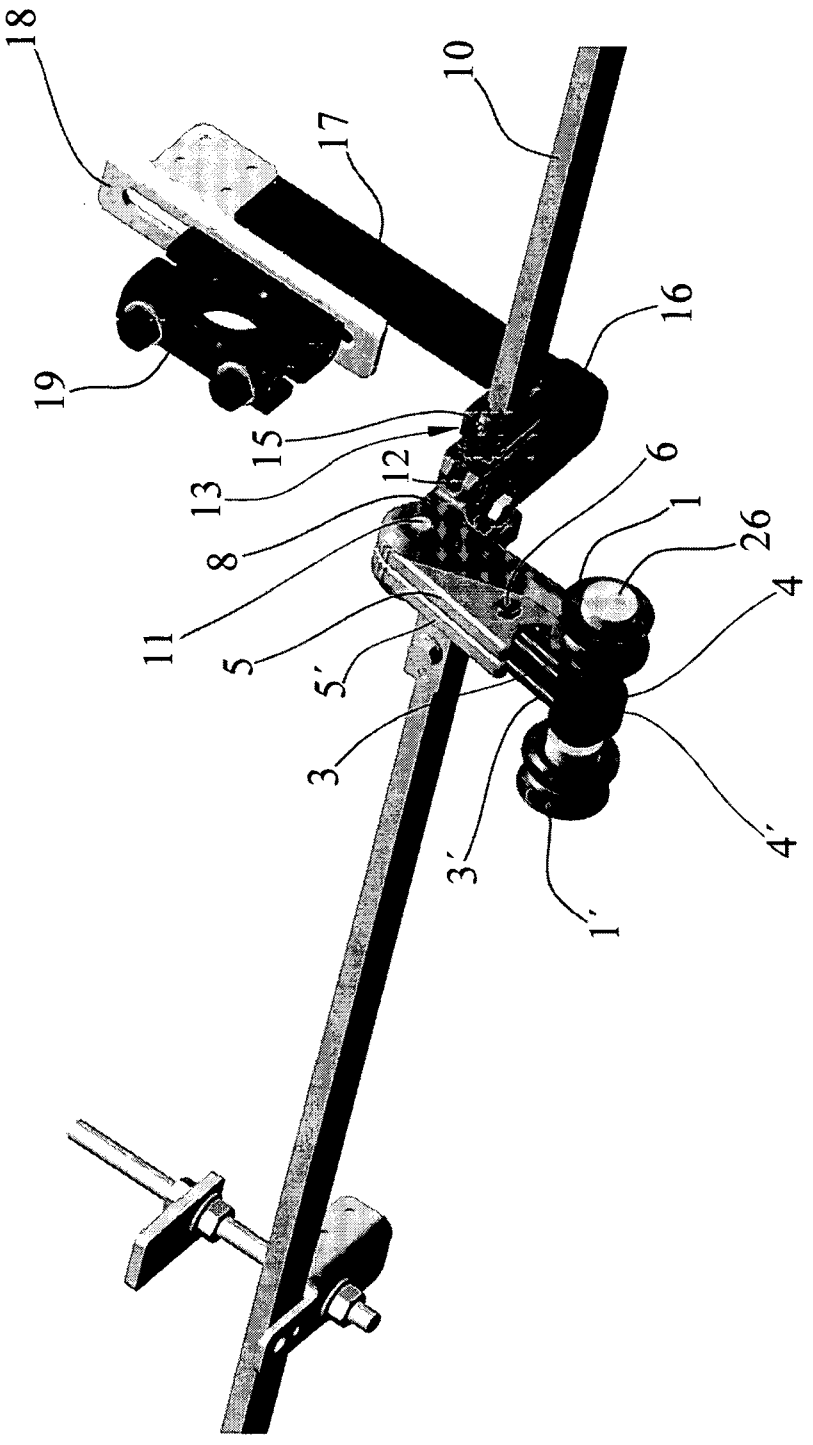

FIG.1

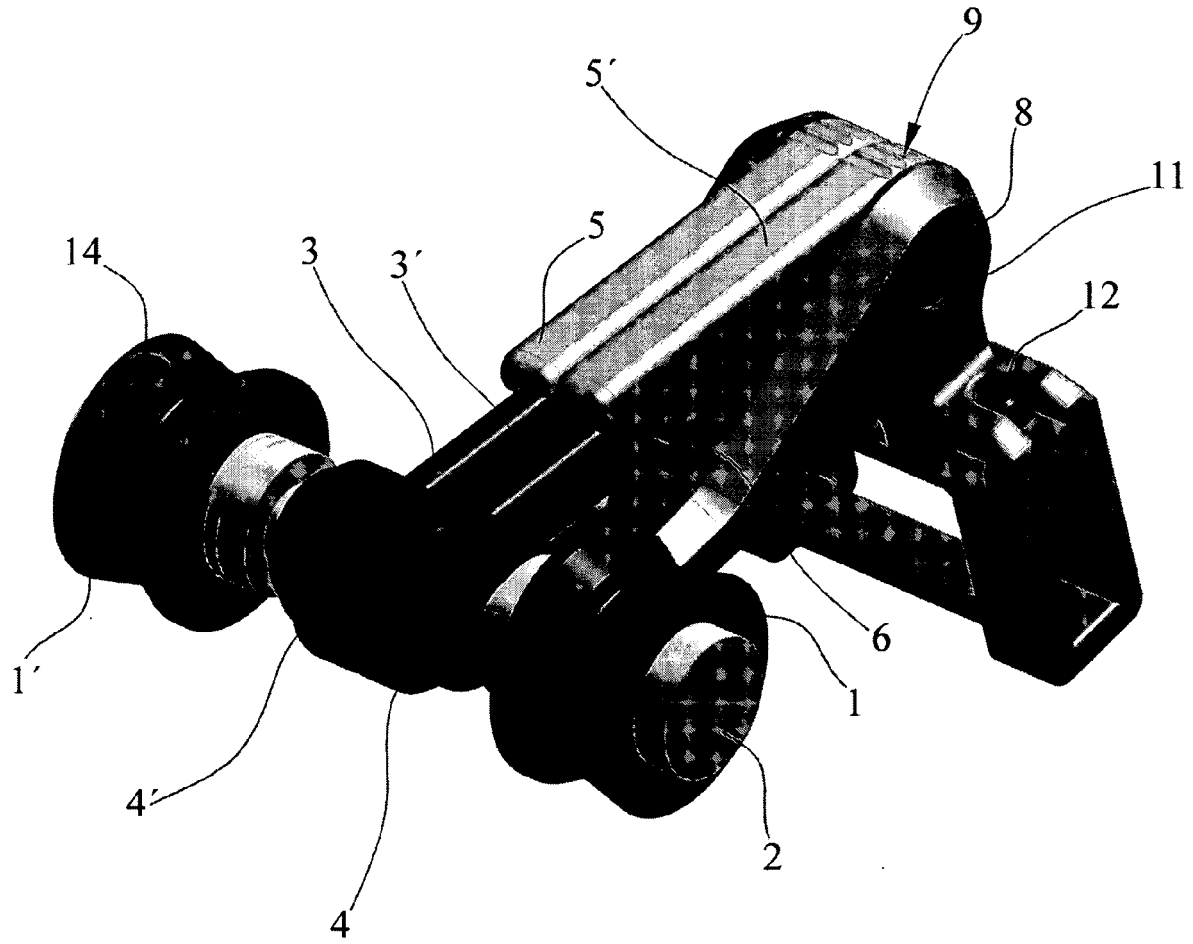

FIG.2

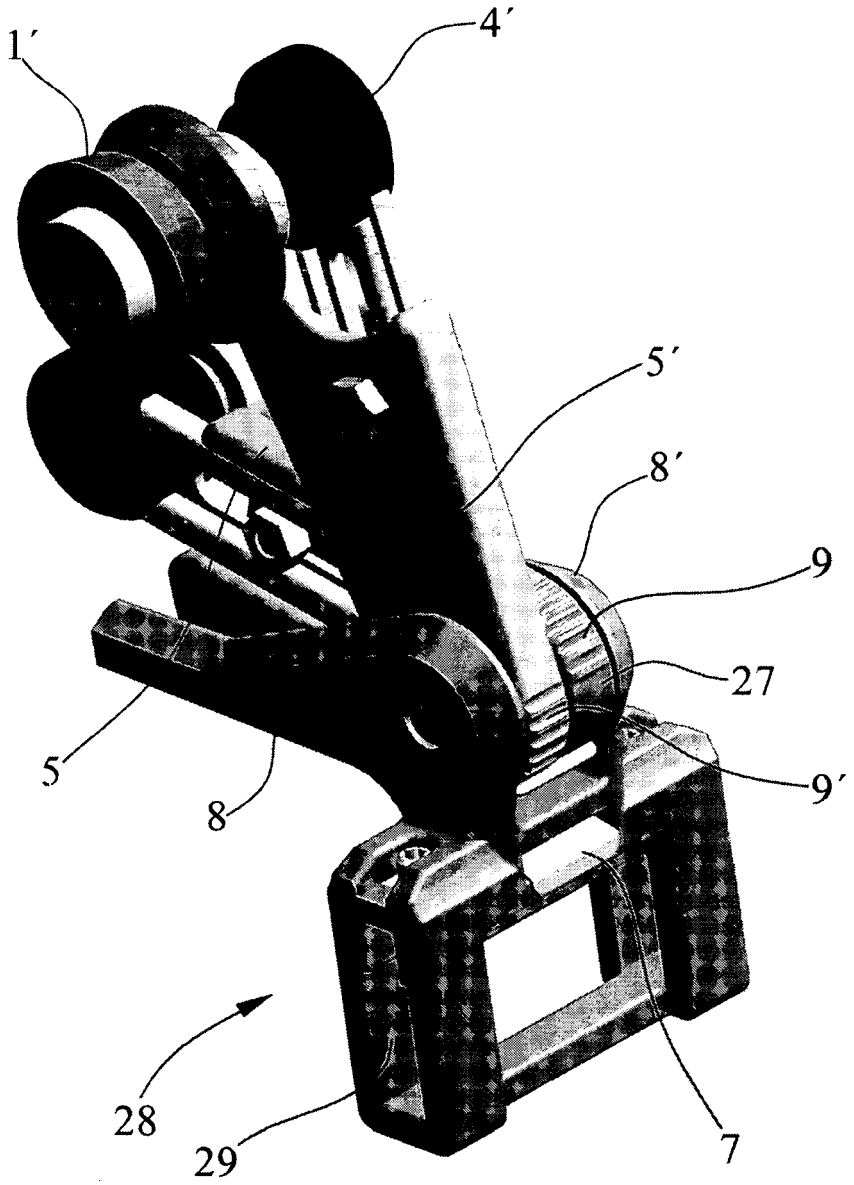

FIG.3

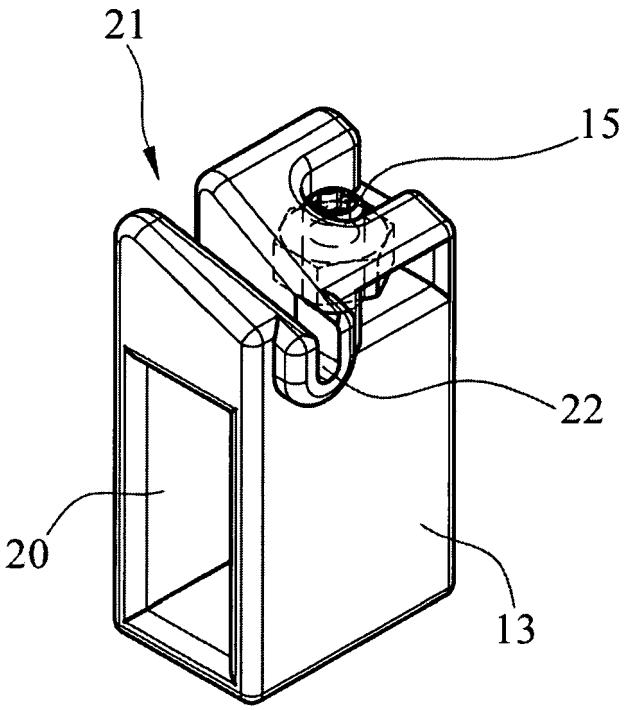

FIG.4

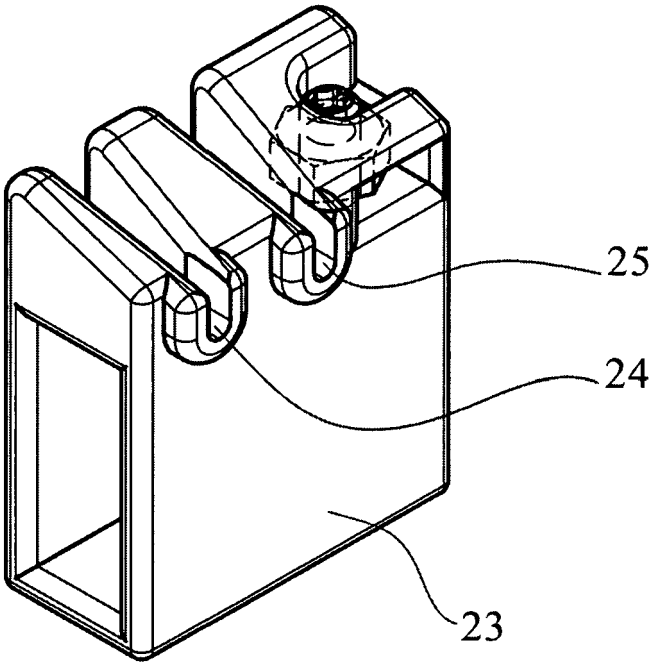

FIG.5