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(54) Apparatus for the production of fancy yarns

(57) Apparatus for producing fancy yarns, that is, yarns formed by the association of more interweaving threads suitably twisted to engage one fuzzy thread, said fuzzy thread intended to be spirally wound onto a gauge (20) via corresponding feeding means associated to an electric motor, characterized in that the said fuzzy thread-feeding means comprise a pair of rotary feeders 13, 130) each of which being connected to an end portion of the shaft (5) of said motor to receive the motion therefrom and interposed between a corresponding flange (10; 100) and a corresponding counterflange (16; 160) which are united to each other by magnetic coupling means (12, 18; 120, 180).

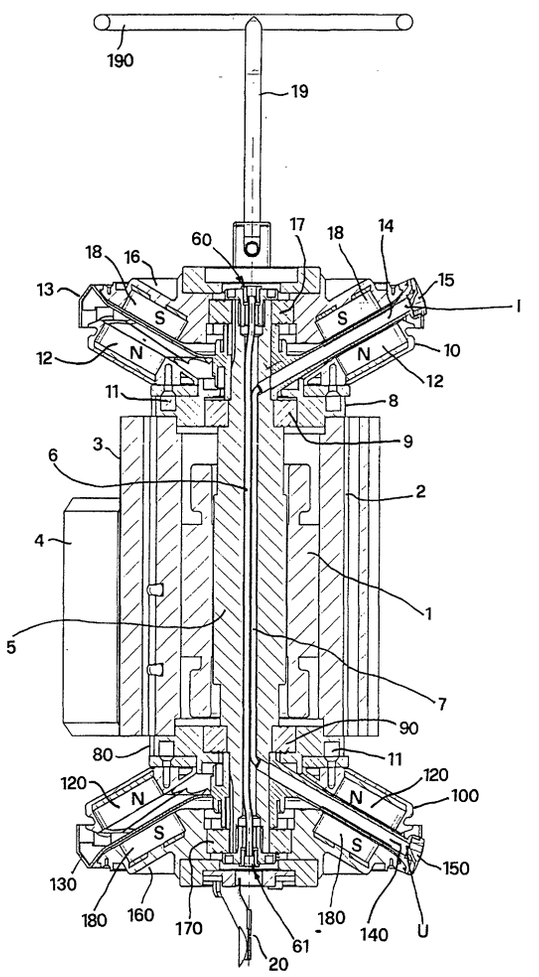

Fig. 2

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Description

[0001] The present invention refers to an apparatus for producing fancy yarns.
The present apparatus results particularly suited for the production of yarns of the so-called "cut-uncut" type.

[0002] It is known that such yarns are obtained by using one fuzzy thread and two interweaving threads. As illustrated in the drawing of Fig. 1, a first interweaving thread (L1) goes through two holes (F) formed on the longitudinal axis of a gauge (C), so as to engage it with the latter and allow the sliding thereof along a substantially vertical direction. The fuzzy thread (E) is wound over the gauge (C) in a continuous succession of turns tightly formed over the first interweaving thread (L1). The second interweaving thread (L2) is positioned on the opposite side of the first one, with respect to the turns of the fuzzy thread, so that these turns results between two interweaving threads. Downstream of the gauge, at the bottom of the relevant shank (GC), the interweaving threads are twisted one over the other by means of a spindle (not shown) located at the bottom of the gauge, with engagement and retention of the fuzzy thread's turns which thereby take up the appearance of closed stitches (M) projecting radially from the twisted interweaving threads. A blade (not shown in the drawing of Fig. 1) provides for cutting the fake-stitch turns of the fuzzy thread, the blade being activated and deactivated over preset periods of time. Where the cut of the fuzzy thread's turns is made, the same turns form a set of segments radially projecting from the interweaving threads, as much as it occurs for the chenille. Accordingly, the thread exhibits portions appearing likewise the chenille alternating with portions which appear unchanged with respect to the configuration exhibited at the exit from the outlet. The yarn thus produced collects on the same spindle for the twisting of the interweaving threads.

[0003] The main object of the present invention is to provide an apparatus allowing the production of fancy yarns made as above, by using a system structurally simpler and more reliable than those used so far. This result has been achieved, according to the invention, by providing an apparatus having the characteristics indicated in claim 1. Further characteristics being set forth in the dependent claims.

[0004] The present invention makes it possible to simplify the industrial production of apparatuses intended for the manufacturing of fancy yarns and, in particular, of so-called "cut-uncut" yarns. An apparatus according to the present invention is relatively simple to make, cost-effective, reliable also after a prolonged service life and allows the production of yarns of better quality.

[0005] These and other advantages and characteristics of the invention will be best understood by anyone skilled in the art from a reading of the following description in conjunction with the attached drawings given as a practical exemplification of the invention, but not to be considered in a limitative sense, wherein:

- Fig. 1 is a schematic representation of the disposition of interweaving threads and of the fuzzy thread in correspondence of the gauge;
- Fig. 2 is a view in diametrical section of an apparatus according to the invention;
- Fig. 3 is a view in diametrical section of the bottom of the apparatus of Fig. 2, showing the blade unit:
- Fig. 4 is an ensemble side view of the present apparatus;
- Fig. 5 is a perspective view from below of the apparatus in Fig. 4;
- Fig. 6 is a perspective view in reduced scale of the rotor of the apparatus illustrated in the previous figures.

[0006] Reduced to its basic structure, and reference being made to the figures and the attached drawings, an apparatus according to the invention comprises:

- an electric motor with hollow stator (1) having vertical axis when in operating condition and with the pack of stator coils (2) being predisposed externally and coaxially thereto, and whose shell (3) is to be blocked to a fixed frame (F) by means of a bracket (4): the rotor (5) of said motor being received coaxially within the longitudinal cavity of the stator (1) and being longitudinally hollow as well;
- a first tubular guide (6) for guiding a first interweaving thread coaxially and internally to said rotor (5): the said guide (6) having a ceramic bush (60) in correspondence of the respective inlet section (facing upwards in Fig. 2) and a similar bush (61) in correspondence of the outlet section to ease the sliding of the interweaving thread without appreciable friction;
- a second tubular guide (7) for the fuzzy thread: said second guide (7) being inside the rotor (5) and with the respective upper and lower ends located in correspondence of two openings (50) disposed on a same generatrix of the rotor (5) (best seen in Fig. 6);
- an upper circular flange (8) and a lower circular flange (80) fixedly fitted on the upper, respectively lower bases of said motor, coaxially to the rotor (5) but isolated therefrom by corresponding bearings (9, 90);
- an upper conical flange (10) and a lower conical flange (100) respectively fixed to said upper circular flange (8) and lower circular flange (80) by corresponding fastening pins (11): each of said conical flanges (10, 100) being provided with a seat for one or more magnets (12, 120) having preset polarity (N, in the example of Fig. 2);
- a pair of rotary feeders (13, 130) for feeding the fuzzy thread, each of which is keyed onto a corresponding end portion of the rotor (5): each of said feeders (13, 130) exhibiting a tubular length (14, 140) communicating, on one side, with one of said openings (50) of the rotor (5), and on the opposite

side, with the outside, so as to complete the guide for the fuzzy thread inside the apparatus, and terminating with a corresponding anti-friction ceramic bush (15, 150);

- two counter-flanges (16, 160) each of which is on opposite side of a corresponding conical flange (10, 100) with respect to the relevant rotary feeder (13, 130) and is mounted on the corresponding terminal length of the rotor (5) with the interposition of an isolation bearing (17, 170): each of said counter-flanges (16, 160) being provided with a seat for one or more magnets (18, 180) (of (S) polarity in the example of Fig. 1) which are opposite in sign to that of magnets (12, 120) being housed within the conical flanges (10, 100);
- a container (19) whithin which a reel (not shown in the drawings) can be housed for feeding the interweaving thread to be passed into the tubular guide (6) inside the rotor (5): said container (19) being solid to the upper conical counter-flange (16) and provided with an upper anti-balloon edge (190);
- a gauge (20) fixed at the bottom of the lower conical counter-flange (160);
- a blade (21) mounted sideway of said gauge (20) on a bracket (210) to be fixed to said frame (F) and associated with an electromagnetic actuator (211), mounted on the same bracket (210) and determining periodically, that is, at intervals of preset time, the movement of blade (21) close to the gauge (20) to cut the turns of the fuzzy threads formed therein and, vice versa, the movement of same blade away therefrom;
- means for feeding a second interweaving thread, with a draw roller (22) and an underlying counter-roller (23) associated to a driving element (not shown in the drawings): said means (22, 23) being on opposite side of the blade (21) with respect to the gauge (20). The counter-roller (23) drives the roller (22) into motion by friction.

[0007] In practice, the flanges (10) and (100) result fixed, as they are blocked to the frame (F) by the circular flanges (8) and (80) fitted on the upper and lower bases of the motor which, in turns, is blocked to the frame (F) by the bracket (4). The conical counter-flanges (16) and (160) also result fixed, inasmuch as they are blocked to the respective conical flanges (10) and (100) by the magnetic coupling provided by the magnets (12, 120; 18, 180) housed therein. Similarly, the container (19) and gauge (20) are fixed because solid to the upper (16) and respectively lower (160) conical counter-flange. The rotary feeders (13, 130), which feed the fuzzy thread, rotate between corresponding pairs of conical flanges and counter-flanges (12, 16; 120, 160), at the same speed as rotor (5) since they are solid thereto. The fuzzy thread enters through the outward-facing section (I) of the tubular length (14) exhibited by the upper rotary feeder (13) and comes out therefrom through the homologous section (U) of the tubular length (140) exhibited by the lower rotary feeder (130). The rotation of feeders (13, 130) causes the fuzzy thread to spirally wind over the gauge (20), that is, over the first interweaving thread which, according to the conventional drawing of Fig. 1, is fed from above, centrally with respect of gauge (20) as the outlet section of guide (6) is in correspondence of the latter. The second interweaving thread, according to the above said drawing, is fed laterally with respect to the gauge, by means of roller (22). The interweaving threads, twisted by means of spindles (not shown) located at the bottom of the apparatus, engage the turns of the fuzzy thread. Periodically, as above mentioned, the blade (21) is placed at a position ready for cutting the turns of the fuzzy thread and then moved back to the starting, inoperative position. More specifically, the blade (21) is kept normally in retracted position by a spring (218) and moved to the cutting position by the electromagnetic actuator (211) which results kinematically connected to the blade (21) via a series of levers (219) suitably hinged to each other.

[0008] In this way, there is produced the fancy yarn. Advantageously, according to the invention, the tubular length (14) of the upper rotary feeder (13) is made to converge toward the axis of rotor (T5) in such a direction that the respective outward-facing section (I) results at a higher level than that connected to the corresponding opening (50) of rotor (5).

[0009] Also advantageously, provision is made for the tubular length (140) of the lower rotary feeder (130) to converge toward the axis of rotor (5) in such a direction that the respective outward-facing section (U) results at a lower level than that connected to the corresponding opening (50) of rotor (5).

Claims

1. Apparatus for producing fancy yarns, that is, yarns formed by the association of more interweaving threads suitably twisted to engage one fuzzy thread, said fuzzy thread intended to be spirally wound onto a gauge (20) via corresponding feeding means associated to an electric motor, **characterized in that** the said fuzzy thread-feeding means comprise a pair of rotary feeders 13, 130) each of which being connected to an end portion of the shaft (5) of said motor to receive the motion therefrom, and interposed between a corresponding flange (10; 100) and a corresponding counter-flange (16; 160) which are united to each other by magnetic coupling means (12, 18; 120, 180).

2. Apparatus according to claim 1, **characterized in that** said magnetic coupling means consist of pairs of magnets (12, 18; 120, 180) opposite in sign, which are housed within facing seats provided in said flanges (10, 100) and, respectively, in said

counter-flanges (16, 160).

3. Apparatus according to claim 1, **characterized in that** said motor comprises a stator (1) with a central longitudinal cavity, having vertical axis when in operating condition and with the pack of stator coils (2) being predisposed externally and coaxially thereto, and whose shell (3) is to be blocked to a fixed frame (F): the rotor (5) of said motor being received coaxially within the longitudinal cavity of the stator (1) and being longitudinally hollow as well, provision being also made for a first tubular guide (6) for guiding a first thread and a second tubular guide (7) for a second thread, said guides being coaxial to, and inside said rotor (5).

4. Apparatus according to claim 1, **characterized in that** it comprises an upper circular flange (8) and a lower circular flange (80) fixedly fitted on the upper, respectively lower bases of said motor, coaxially to the rotor (5) but isolated therefrom by corresponding bearings (9, 90), **in that** the said flanges (10, 100) consist of an upper conical flange (10) and a lower conical flange (100) respectively fixed to said upper circular flange (8) and lower circular flange (80), **in that** each of said conical flanges (10, 100) being provided with a seat for one or more magnets (12, 120) having preset polarity (N), and **in that** each of said feeders (13, 130) exhibiting a tubular length (14, 140) communicating, on one side, with the internal cavity of the rotor (5) via a relevant opening (50), and on the opposite side, with the outside: each of said counter-flanges (16, 160) being on opposite side of the conical flange (10, 100) with respect to the corresponding rotary feeder (13, 130) and provided with a seat for one or more magnets (18, 180) of a sign opposite to that of magnets (12, 120) housed within the conical flanges (10, 100).

5. Apparatus according to claim 1, **characterized in that** the rotary feeder (13) located on top has the relevant tubular length (14) convergent toward the axis of rotor (5) in such a direction that the respective outward-facing section (I) results at a higher level than that connected to the corresponding opening (50) of rotor (5).

6. Apparatus according to claim 1, **characterized in that** the rotary feeder (130) located at the bottom has the relevant tubular length (140) convergent toward the axis of rotor (5) in such a direction that the respective outward-facing section (U) results at a lower level than that connected to the corresponding opening (50) of rotor (5).

7. Apparatus according to one or more claims 1, 4, 5 and 6, **characterized in that** the said rotary feeders (13, 130) feed a fuzzy thread.

8. Apparatus according to claim 3, **characterized in that** the said first thread is a first interweaving thread.

9. Apparatus according to claim 3, **characterized in that** the said second thread is a second fuzzy thread.

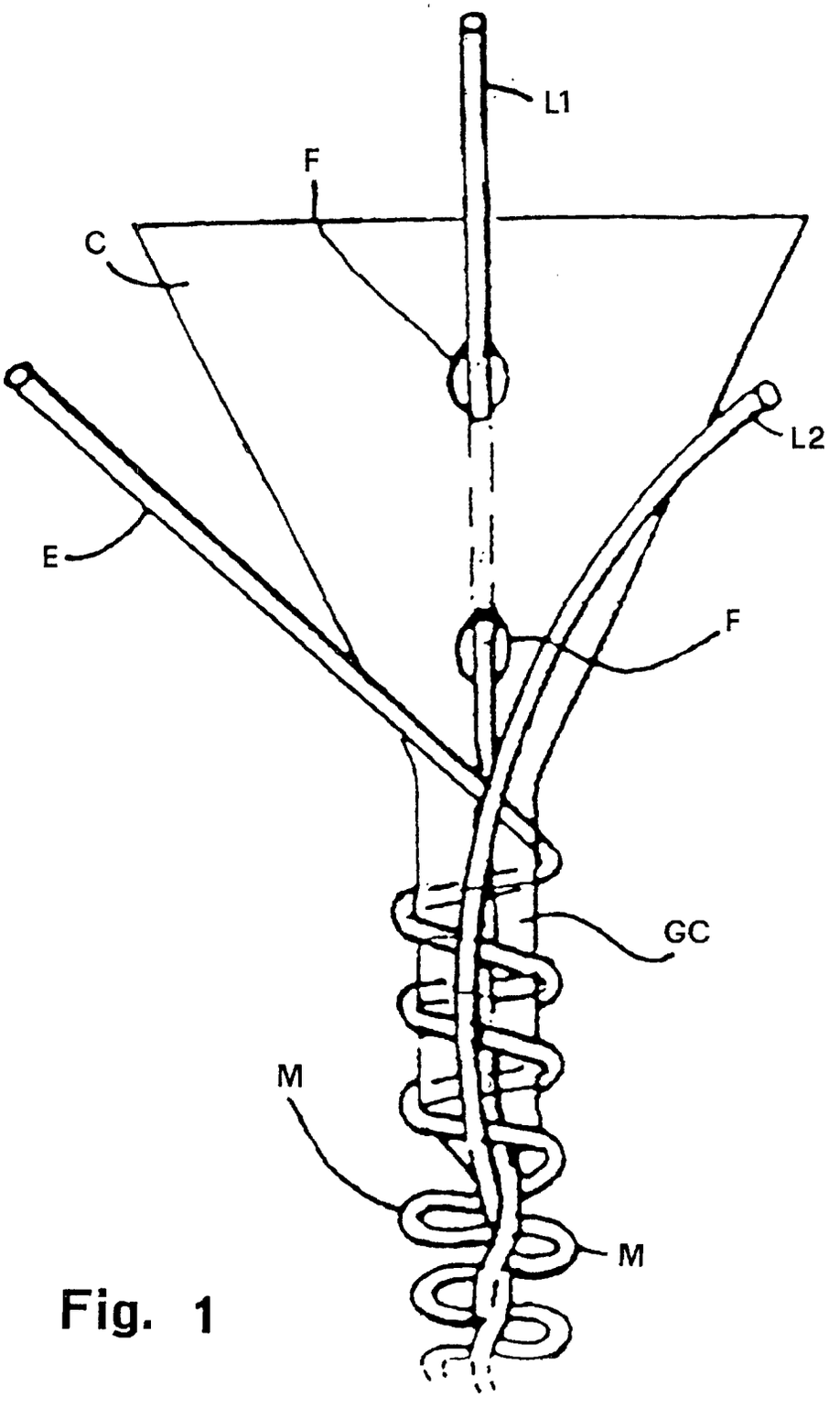

Fig. 1

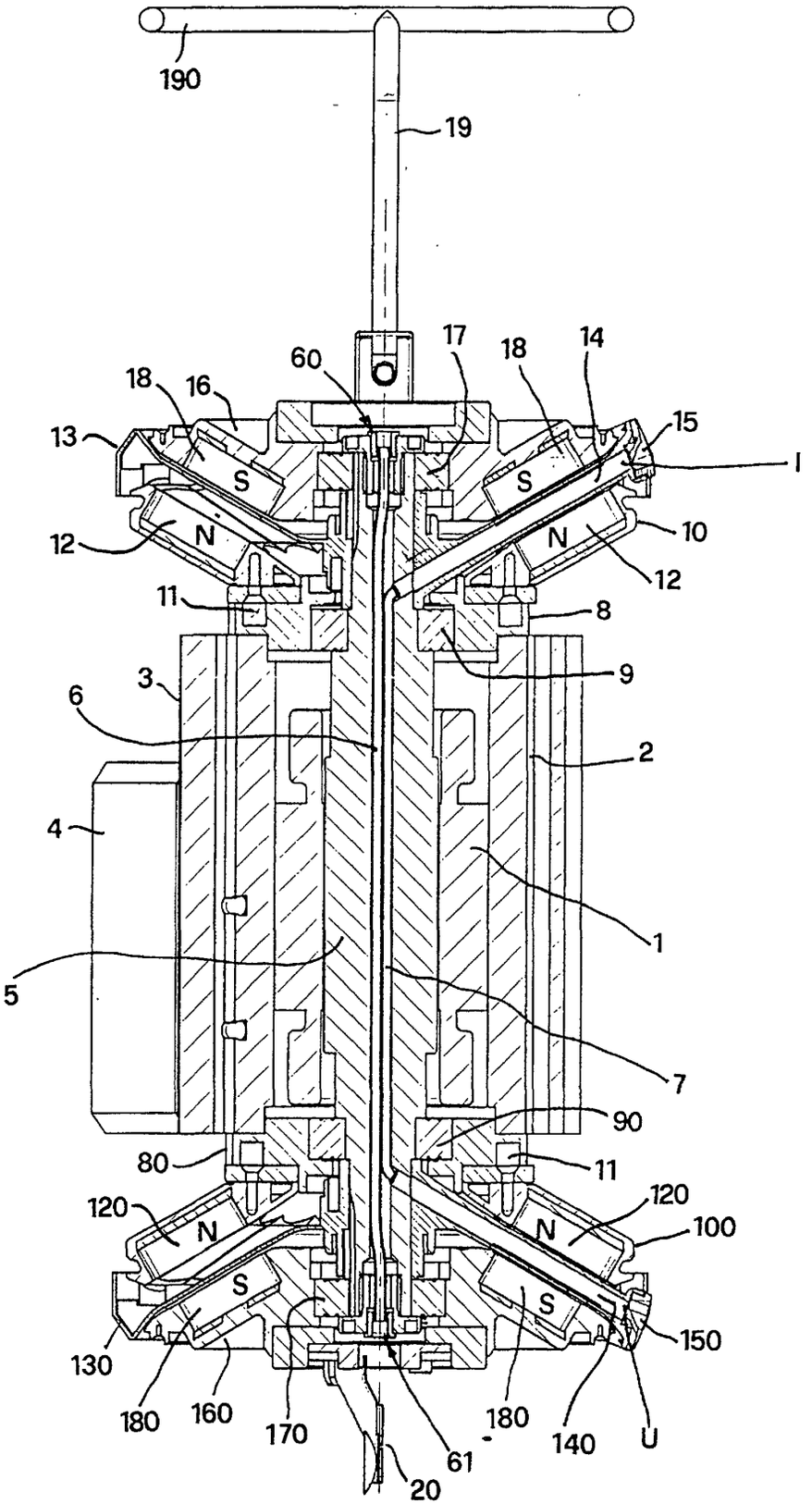
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Fig. 2

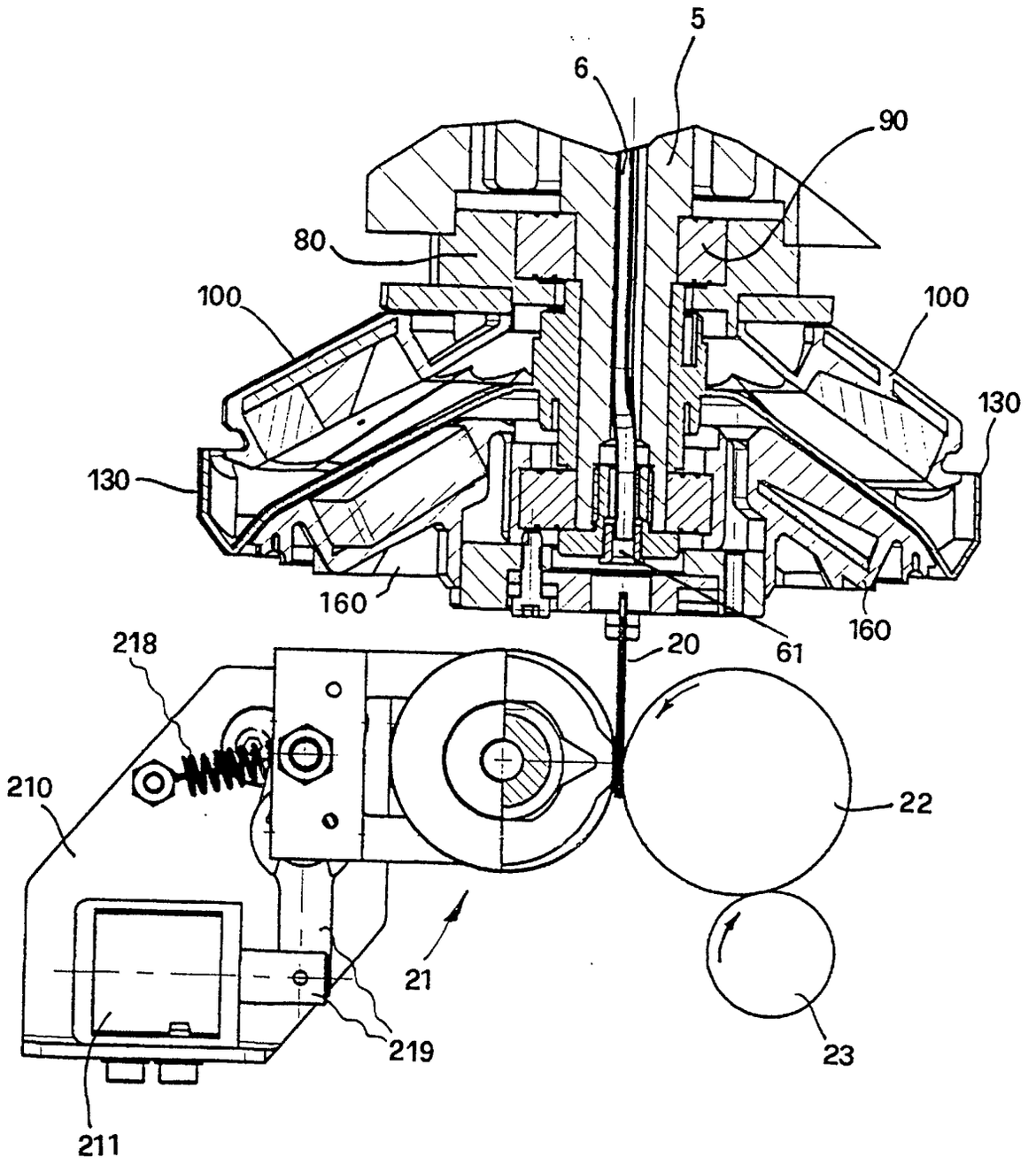

Fig. 3

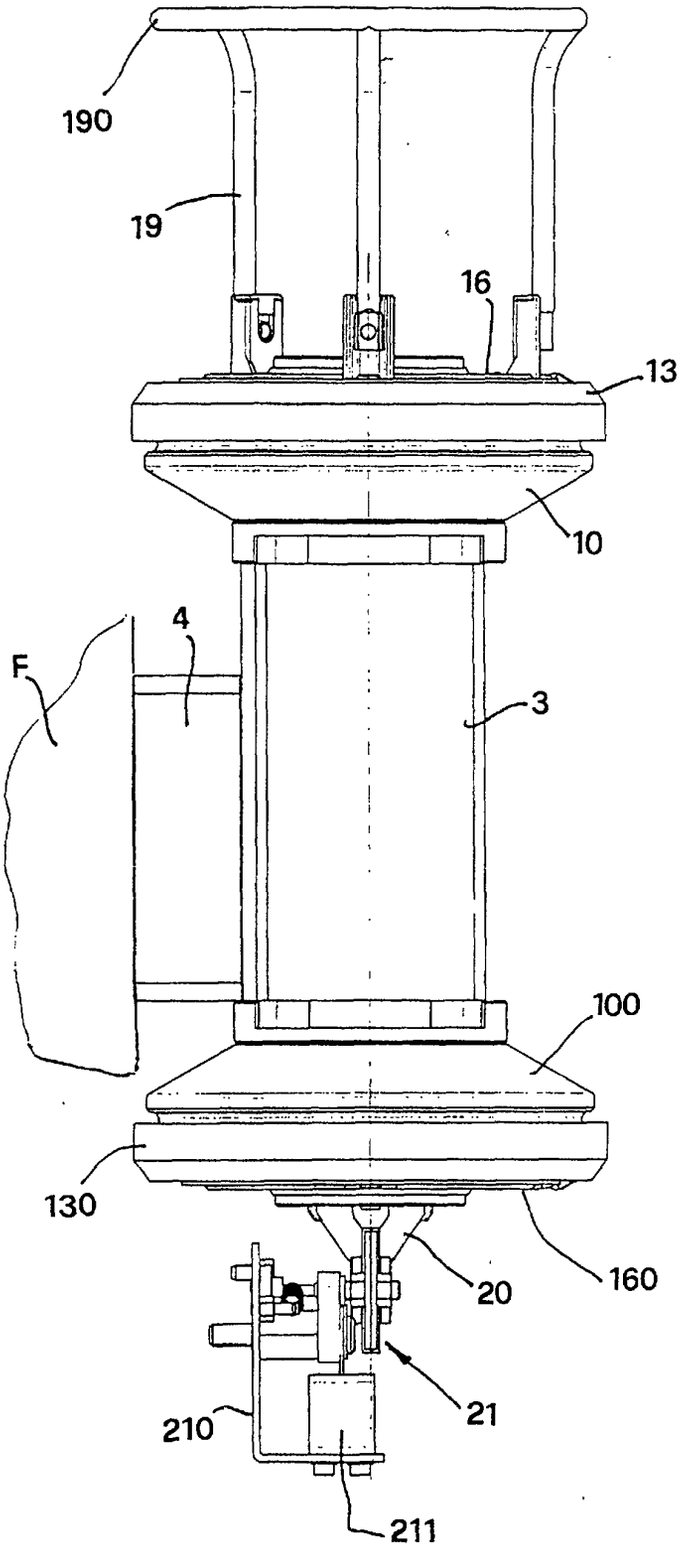

Fig. 4

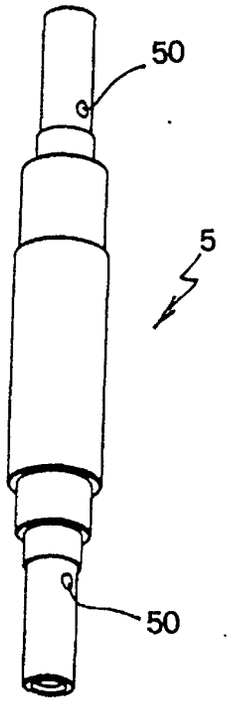

Fig. 6

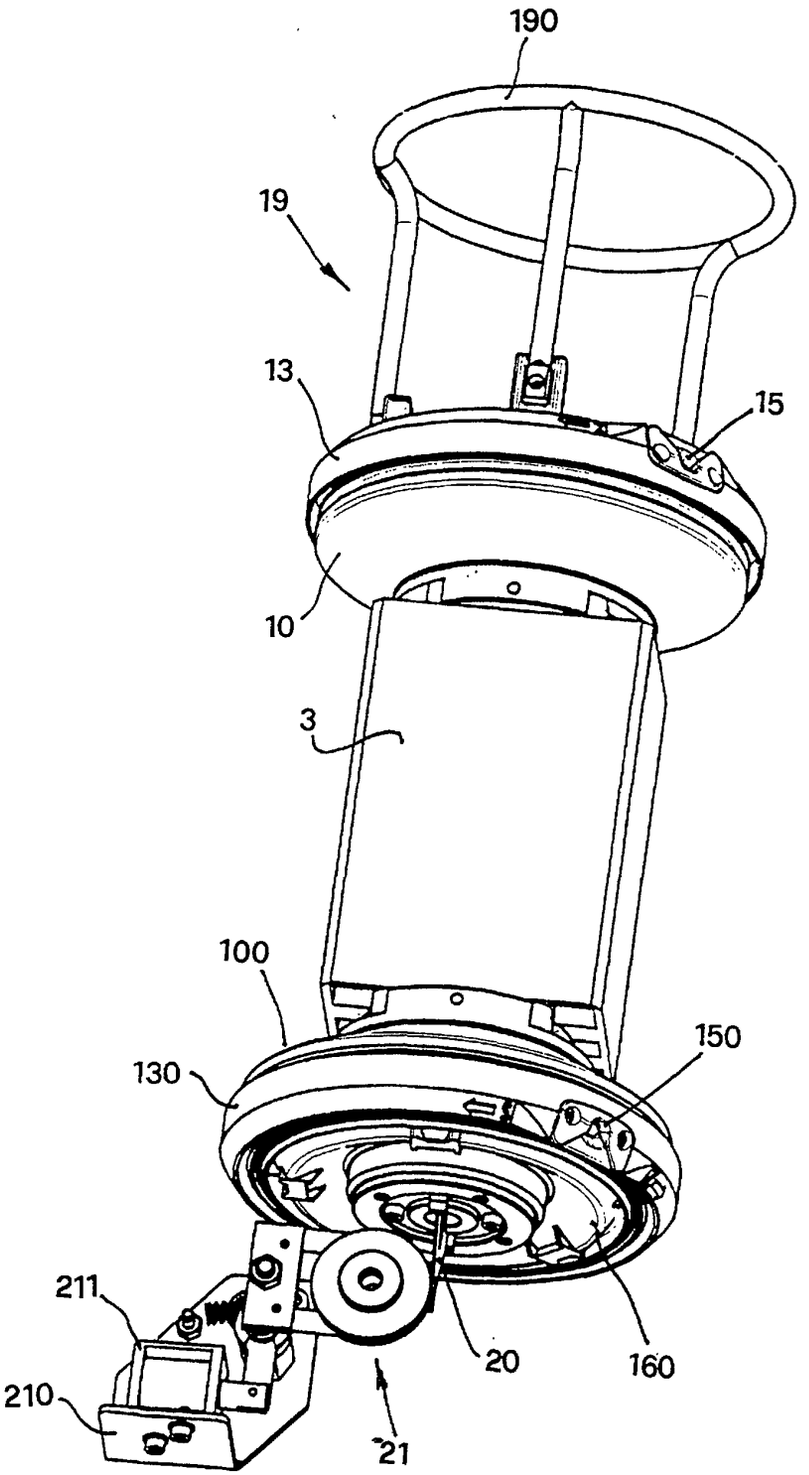

Fig. 5