(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 335 101 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
13.08.2003 Bulletin 2003/33

(51) Int Cl.[7]: **E06B 9/54**, E06B 9/42

(21) Application number: **03386002.4**

(22) Date of filing: **31.01.2003**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PT SE SI SK TR
Designated Extension States:
AL LT LV MK RO

(30) Priority: **31.01.2002 GR 2002010056**
11.09.2002 GR 2002100410

(71) Applicant: **Stavrakas Konstantinos**
GR-641 00 Greece (GB)

(72) Inventor: **Stavrakas Konstantinos**
GR-641 00 Greece (GB)

(54) Mechanism for the controlled retracting movement of a roller insect-blocking foil means

(57) A mechanism for the controlled retracting movement of a roller insect-blocking foil means. The mechanism comprises wear-free, reliable components and is of simple construction and assembly, incorporating means for selective activation thereof in the retracting, rolling up direction of movement of the roller insect-blocking foil means 1 only. The mechanism consists in the connection of the drum 8 moving under the action of resilient spring means during rolling up of the insect-blocking foil means 1 to a shaft means 9 moving within a chamber 7 incorporating a relatively viscosity independent chamber filling medium to effect a frictionally enhanced and constantly acting movement of the retarding mechanism. The filling medium is either a malleable solid substance or a fluid means acting in association with an arrangement of diaphragms 12 being provided with a plurality of perforations 12a for selectively allowing passage of the fluid means.

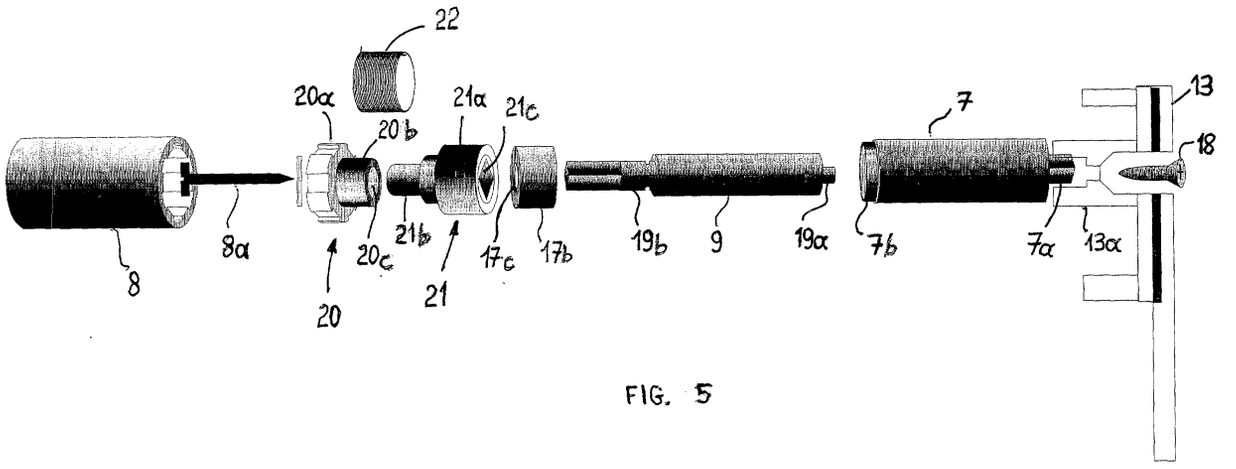

FIG. 5

EP 1 335 101 A2

Description

[0001] The present invention relates to a mechanism for effecting a controlled retracting movement of a roller insect-blocking foil means adapted for blocking the entrance of insects through doors or windows.

[0002] Such roller blind means have a textile structure with a mesh allowing lighting and fresh air passage, but blocking the intrusion of undesirable insects. These roller insect-blocking foil means are wound round a drum installed within a housing on top of the door/window opening, said drum being set in a rotational winding or unwinding movement to enable retraction or deployment of the roller insect-blocking foil means respectively.

[0003] The roller insect-blocking foil means when deployed is locked onto hook means at the bottom of the opening and is automatically wound round the drum when released from these hook means. Such winding retracting movement of the roller insect-blocking foil means is effected at undesirably high speed resulting from the resilient spring means acting upon the drum, such high speed possibly leading to accidents, whilst reliable operation of the roller blind means may be deteriorated due to frequent high speed retracting movement thereof.

[0004] With the scope of overcoming the abovementioned drawbacks, mechanisms have been developed for effecting a controlled retracting rolling up movement of such roller insect-blocking foil means. Such mechanisms, either mechanical or hydraulic, are often complex clutch arrangements and lack reliable operation with the passage of time due to rapid wear of their mechanical components and/or unreliable controlling of temperature dependent viscosity in fluid operated brake means. By way of example, the viscosity of water varies between the value of $1,1X10^{-3}$ Nsm^{-2} at a temperature of 15° C, the value of $0,8X10^{-3}$ Nsm^{-3} at a temperature of 30° C and $0,6X10^{-3}$ Nsm^{-2} at a temperature of 50° C. Such problems are enhanced when the mechanisms are operated in both directions of winding or unwinding the roller insect-blocking foil means, whilst it must be emphasized that such retarding mechanisms are only necessary to act in the rolling up direction of winding of said roller insect-blocking foil means.

[0005] It is therefore the object of the present invention to propose a mechanism for the controlled retracting movement of a roller insect-blocking foil means, said mechanism comprising wear-free, reliable components and being of simple construction and assembly, incorporating means for selective activation thereof in the retracting, rolling up direction of movement of the roller insect-blocking foil means only, and being based in the connection of the drum moving under the action of resilient spring means during rolling up or raising of said insect-blocking foil means to a shaft means moving within a chamber incorporating a relatively viscosity independent chamber filling means to effect a frictionally enhanced and constantly acting movement of the retarding mechanism, said chamber filling means being either a malleable solid substance or a fluid means acting in association with an arrangement of diaphragms being provided with a plurality of perforations for selectively allowing passage of the fluid means.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006]

Fig. 1 shows an illustrative arrangement of a roller insect-blocking foil means particularly adapted for blocking the entrance of insects.

Figs. 2-4 show illustrative diagrams of the employment of perforated diaphragm means adapted in the shaft means moving within a chamber incorporating a relatively viscosity independent chamber filling means for controlling passage of fluid from one to the other side thereof.

Figs. 5-6 show a perspective and cross sectional view respectively of the layout of the shaft means moving within a chamber incorporating a relatively viscosity independent chamber filling means, preferably a malleable solid substance, said shaft means being connected to the winding drum of the roller insect-blocking foil device.

Figs. 7-8 show alternative arrangements of mounting of the shaft means of Figs. 5-6.

DESCRIPTION OF PREFERRED EMBODIMENTS

[0007] Fig. 1 shows a typical configuration of a roller insect-blocking foil means 1 being wound around a drum means 8 installed on top of the door or window opening wherein the foil means is deployed, within a housing unit 4. When the foil means 1 is deployed, it slides within side profile guide rails 2 that are mounted onto the side wall structure around the opening by means of bolts 6. A horizontally extending profile 3 at the bottom end of the foil means 1 constitutes the means of hooking the foil means and maintaining it at a deployed position by means of hooking mechanisms 5.

[0008] A shaft 16 extends along the drum unit 8 and a resilient spring means 10 is wound around the shaft 16, said spring means 10 operating so as to be loaded during deployment of the foil means 1 and unloaded in the reverse direction of movement thereof. The drum unit 8 and spring carrying shaft 16 are located within the housing unit 4, that is closed by side plug means 13 being fixedly mounted onto the side wall structure of the opening.

[0009] The present invention is directed towards handling the problem encountered with the excessive energy being released by the resilient spring means 10 when the foil means 1 is unhooked and free to rise upwards winding around the drum unit 8. The solution proposed is the connection of the drum unit 8 to a shaft means 9

that is allowed to rotate within an environment of increased friction established within the chamber 7, thereby acting so as to retard the movement of the drum unit 8.

[0010] As shown in Fig. 5 or 6, the shaft 9 is provided with a frontal connecting end 19a that fits within a correspondingly shaped recession 17a of the chamber 7 and with a rear connecting end 19b being provided with a longitudinally extending opening 19c. A plug means 17b is fitted around the rear connecting end 19b of the shaft 9 and is employed in water tightly closing the chamber 7. The side plug means 13 is provided with an inwardly projecting tubular element 13a that receives the frontal projecting end 7a of chamber 7, a bolt 18 being used in securely connecting the two elements.

[0011] The shaft 9 is selectively engaged to the drum unit 8 in the retracting, rolling up direction of movement of the roller insect-blocking foil means 1 only, by means of an engaging mechanism comprising in combination a pair of cooperating members 20,21 and a spring means 22.

[0012] Member 20 is provided with a first tubular body 20a that is fixedly fitted within the open end of the drum unit 8, so that it becomes rotatable together with the latter. Member 20 is further provided with a second tubular body 20b with an opening 20c adapted to receive the equivalently shaped tubular body 21 b of cooperating member 21.

[0013] Member 21 is provided with a tubular body 21a that extends into the abovementioned tubular body 21b at one end thereof, whilst its other end is provided with a central rectangularly shaped opening 21c within which is fixedly inserted the abovementioned, correspondingly shaped rear connecting end 19b of shaft 9. An elongated pin 8a passes sequentially through the opening 20c of member 20, the opening 21c of member 21, the opening 17c of chamber plug means 17b and through the longitudinally extending opening 19c of the rear connecting end 19b of shaft 9, such connection defining a condition of engagement of shaft means 9 to the drum unit 8.

[0014] The spring means 22 is alternatively located, as depicted in Fig. 7 or Fig. 8 either in between the side plug means 13 and member 21 or in between abovementioned members 20, 21 of the engaging mechanism, that operates so as to engage shaft means 9 of the retarding mechanism to the drum unit 8 during the upward movement of the roller insect-blocking foil means 1 only and disengage the same in the opposite direction of movement.

[0015] In accordance to a preferred embodiment of the invention, chamber 7 is filled with a malleable solid material, that creates a constant, independent of temperature, frictional environment for the movement of shaft means 9, thereby causing the desirable retarding effect. Such malleable solid substance may be selected from a variety of available substances that have this property of malleability, whilst they maintain their humidity without being petrified. Suitable chemical compositions of this category are polyester plasticizers, that have been inorganically thickened and contain a certain additive quantity of silicon resins that impart to them the friction enhancing desired stick grade, as well as corrosion resistant characteristics. An example is the commercially available valve sealant AUDCO VALVE SEALANT 733 that contains a saturated polyester resin in a proportion of 70%, bentone clay-silica in a proportion of 29.4%, 2-imidazoline in a proportion of 0.3% and n-oleoyl sarcosine.1-(2-hydroxyethyl)-2-heptadecenyl in a proportion of 0.3%.

[0016] In accordance to an alternative embodiment of the invention, chamber 7 is being filled with a fluid medium, but the mechanism still remains independent of viscosity variations with temeperature, since fluid flow is primarily controlled by a predefined plurality and shape of perforations 12a in diaphragm means 12 (Figs. 2-4), said diaphragms 12 being located longitudinally along shaft means 9 within the chamber 7 and dividing the chamber 7 in two parts and operating so as to effect a retarding movement of shaft means 9 and accordingly of the drum unit 8 engaged therewith as the fluid contained within the chamber 7 moves from one part of the chamber to the other. An alternative simpler engaging mechanism of shaft means 9 to the drum unit 8 is depicted in Figs. 2-4, wherein a simple nut structure 11a mounted along shaft means 9 is fixedly inserted within the open end of the drum unit 8 and effects engagement of the drum unit 8 to the shaft means 9 only in the aforementioned direction of withdrawal of the roller insect-blocking foil means 1.

[0017] It must herein be noted that the invention is not limited to the above illustrative embodiments that serve the purpose of adequately disclosing the scope of the invention to those skilled in the art.

Claims

1. Mechanism for the controlled retracting movement of a roller insect-blocking foil means (1) used in door or window openings, said mechanism being installed in a housing unit (4) being closed by side plug means (13) fixedly mounted onto the side wall structure of the opening, a drum unit (8) around which winding of said roller insect-blocking foil means (1) takes place during retracting movement thereof being located within said housing unit (4), said drum unit (8) being connected to a shaft (16) bearing resilient spring means (10), said spring means (10) operating so as to be loaded during deployment of said foil means (1) and unloaded in the reverse retracting direction of movement thereof, said mechanism being adapted to handle the excessive energy being released by the resilient spring means (10) when the foil means (1) is let free to rise upwards winding around the drum unit (8) by

connection to means rotatable within an environment of increased friction established within a chamber (7), said means acting so as to retard the movement of the drum unit (8) being **characterized by** that it comprises in combination:

a shaft means (9) moving within said chamber (7), said chamber (7) being filled with a relatively viscosity independent filling medium to effect a frictionally enhanced and constantly acting movement of the retarding mechanism, said shaft means (9) being provided with a frontal connecting end (19a) that fits within a correspondingly shaped recession (17a) of said chamber (7) and with a rear connecting end (19b) being provided with a longitudinally extending opening (19c), a plug means (17b) being fitted around said rear connecting end (19b) of the shaft (9) and employed in water tightly closing said chamber (7), said side plug means (13) being provided with an inwardly projecting tubular element (13a) that receives the frontal projecting end (7a) of chamber (7), a bolt (18) being used in securely connecting said chamber (7) to said side plug means (13), and
means for selective activation of said mechanism in the retracting, rolling up direction of movement of the roller insect-blocking foil means (1) only by selective engagement of said shaft means (9) to said drum unit (8).

2. Mechanism as claimed in the above claim 1, **characterized by** that said relatively viscosity independent filling medium is a malleable solid material that creates a constant, independent of temperature, frictional environment for the movement of said shaft means (9), thereby causing the desirable retarding effect, said malleable solid material being selected from the category of polyester plasticizers that have been inorganically thickened and contain a certain additive quantity of silicon resins imparting to them a friction enhancing stick grade and corrosion resistant characteristics.

3. Mechanism as claimed in above claim 2, **characterized by** that said relatively viscosity independent malleable solid material filling medium is a chemical composition of a saturated polyester resin in a proportion of 70%, bentone clay-silica in a proportion of 29.4%, 2-imidazoline in a proportion of 0.3% and n-oleoyl sarcosine.1-(2-hydroxyethyl)-2-heptadecenyl in a proportion of 0.3%.

4. Mechanism as claimed in the above claim 1, **characterized by** that said engaging mechanism comprises in combination a pair of cooperating members (20,21) and a spring means (22), wherein said member (20) is provided with a first tubular body (20a) that is fixedly fitted within the open end of said drum unit (8), so that it becomes rotatable together with the latter and with a second tubular body (20b) with an opening (20c), and wherein said member (21) is provided with a tubular body (21a) that extends into a tubular body (21b) at one end thereof and into a central rectangularly shaped opening (21c) within which is fixedly inserted said correspondingly shaped rear connecting end (19b) of said shaft means (9), an elongated pin (8a) passing sequentially through the opening (20c) of member (20), the opening (21c) of member (21), the opening (17c) of chamber plug means (17b) and through the longitudinally extending opening (19c) of the rear connecting end (19b) of shaft (9), such connection defining a condition of engagement of said shaft means (9) to the drum unit (8).

5. Mechanism as claimed in the above claim 4, **characterized by** that said spring means (22) is alternatively located either in between the side plug means (13) and said member (21) or in between said members (20, 21) of the engaging mechanism that operates so as to engage said shaft means (9) to said drum unit (8) during the upward movement of the roller insect-blocking foil means (1) only and disengage the same in the opposite direction of movement.

6. Mechanism as claimed in above claim 1, **characterized by** that said relatively viscosity independent filling medium is a fluid means acting in association with an arrangement of diaphragms (12) being provided with a plurality of perforations (12a) for selectively allowing passage of the fluid means, fluid flow being primarily controlled by a predefined plurality and shape of said perforations (12a) in said diaphragms (12), said diaphragms (12) being located longitudinally along said shaft means (9) within the chamber (7) and dividing said chamber (7) in two parts and operating so as to effect a retarding movement of said shaft means (9) and accordingly of the drum unit (8) engaged therewith as the fluid contained within the chamber (7) moves from one part of the chamber to the other.

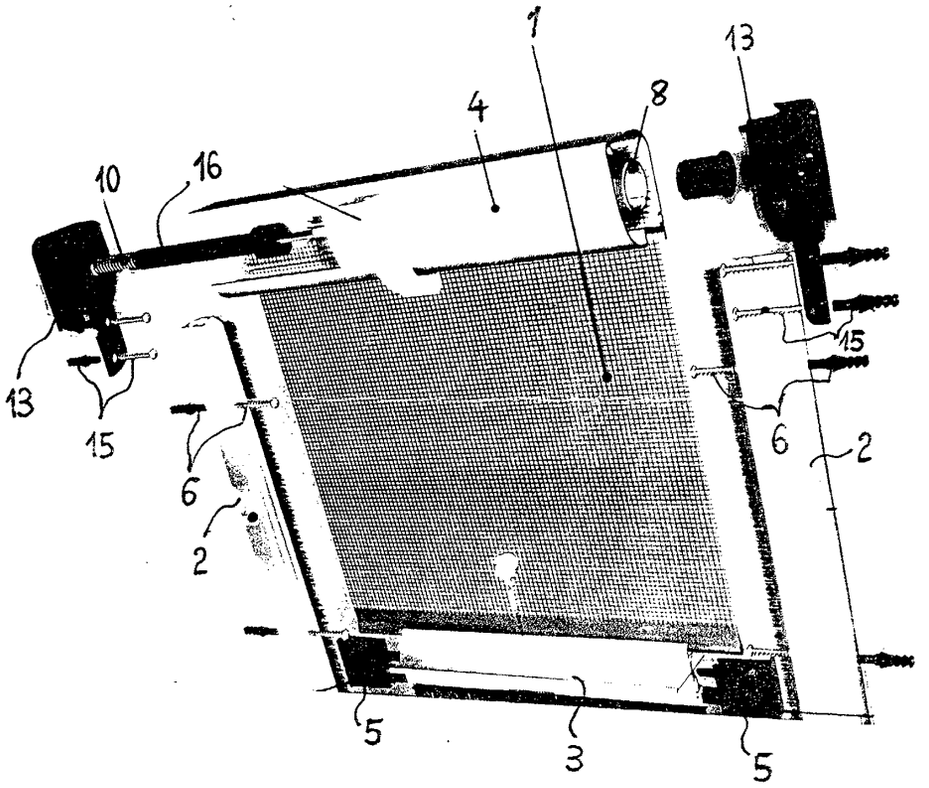

FIG. 1

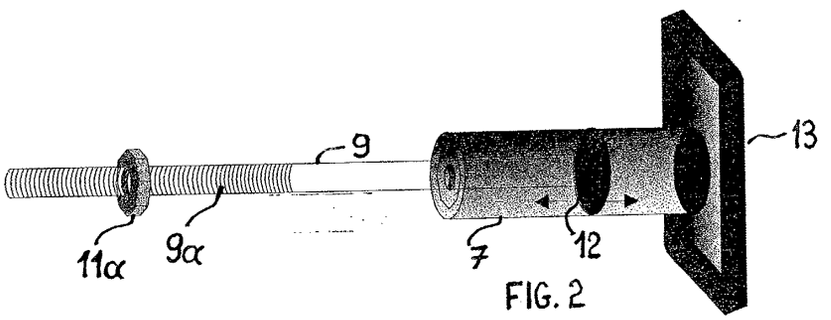

FIG. 2

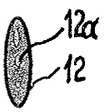

FIG. 3

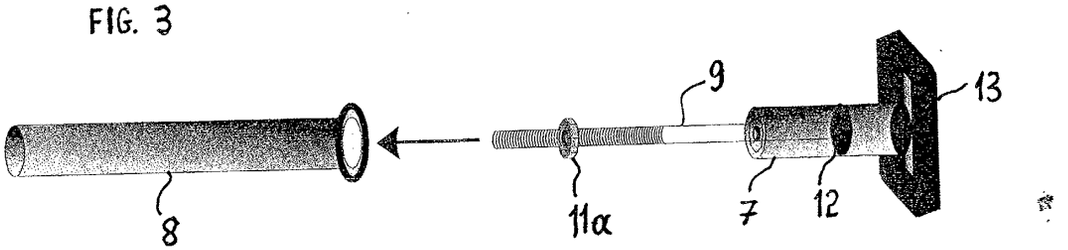

FIG. 4

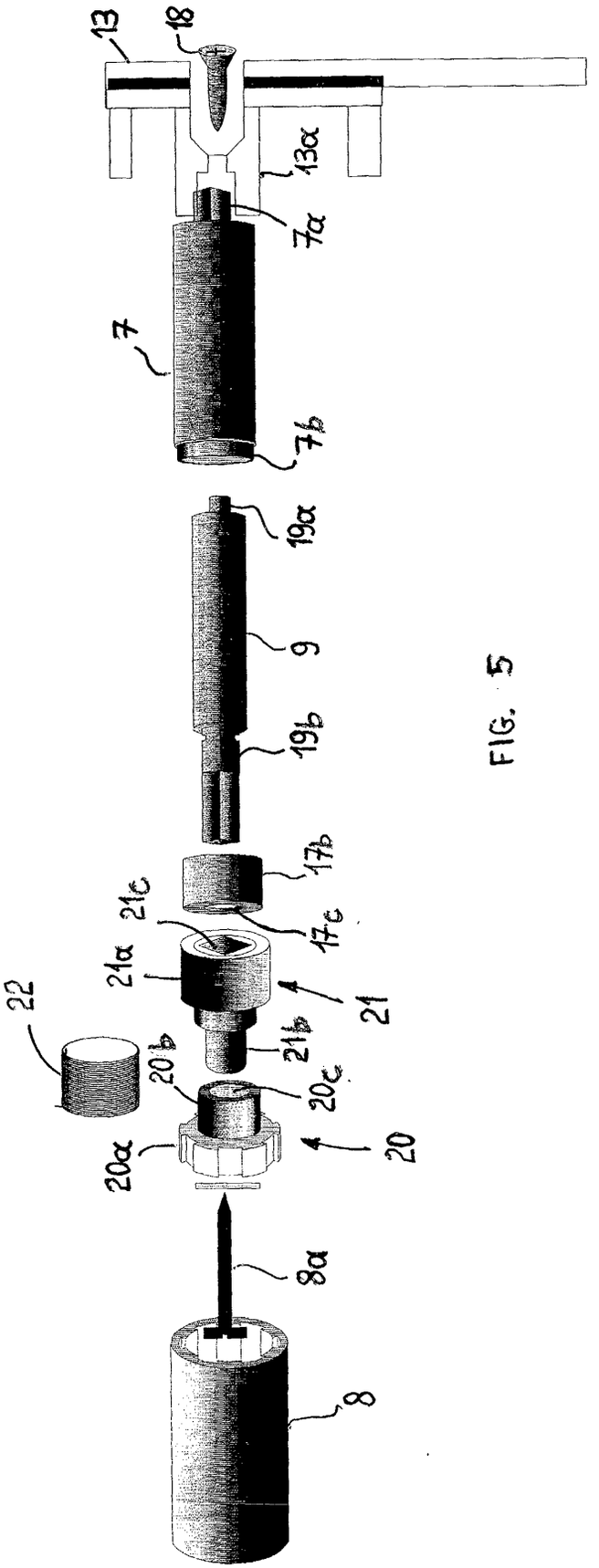
13
18
13a
7a
7
7b
19a
9
19b
17b
21c
17c
21a
21
22
21b
20b
20c
20a
20
8a
8

FIG. 5

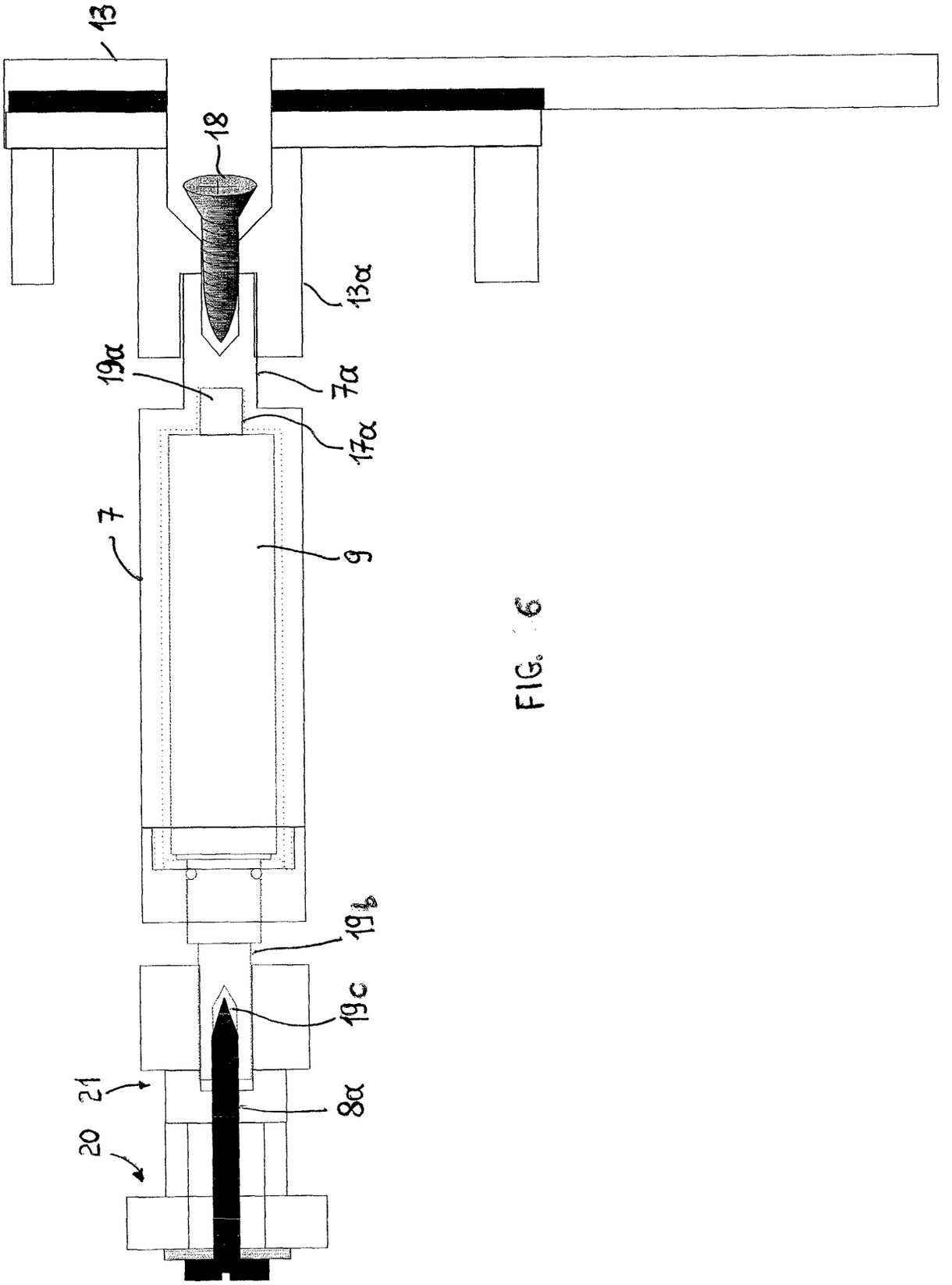

FIG. 6

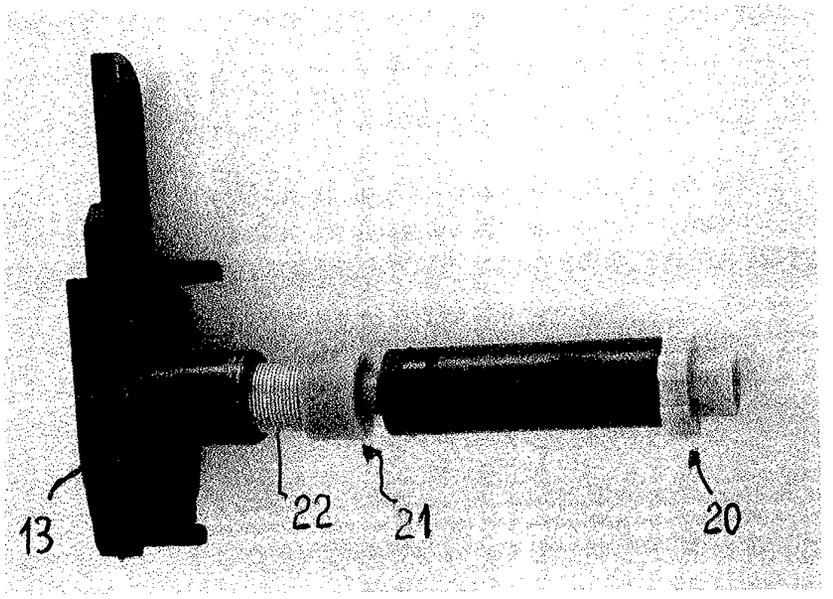

FIG. 7

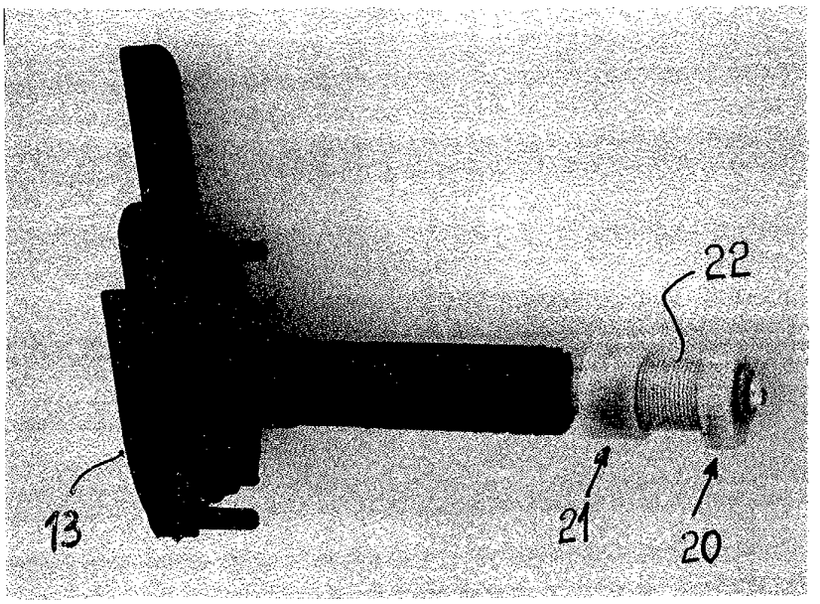

FIG. 8