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(54) **Articulated arm for the support and stretching out of awnings**

(57) An articulated arm (7) for the support and extension of awnings (1), comprising a first and a second half-arms (8, 9) which are connected at respective close ends (11,12) by means of an intermediate joint (13) and each having a respective articulated end (15,16) opposed to said close end (11,12), said first and second half-arm (8,9) being movable between a non-operative bent position and an extended, supporting

position of the articulated arm (7); an elastic member (21) connected to said first and second half-arm (8, 9), which opposes to the bending of said articulated arm (7); and loosening means (27) of said elastic member (21), which are joined with one of said first or second half-arm (8,9) which can be operated while said articulated arm (7) is the bent position.

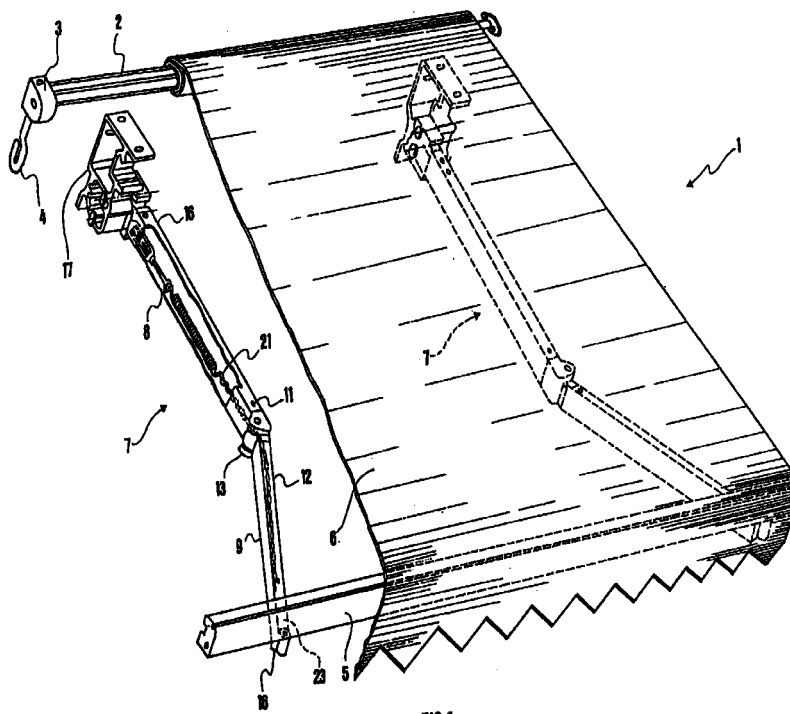


FIG. 1

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Description

[0001] The present invention relates to an articulated arm of the type used to support and extend tents, in particular awnings for protecting terraces, balconies and the like from sunlight.

[0002] The articulated arm of the present invention is of the type comprising a pair of articulated half-arms movable from a non-operative bent position and an extended position, and provided with an elastic member, fastened to each of said half-arms, which opposes to the bending of the arm.

[0003] Articulated arms as set forth above are used to keep the awnings' cloth extended, as well as to take part in unwinding said awnings.

[0004] The elastic member is located so as to keep the arm extended, i.e. to keep it in its normal operative position, when the load to which the elastic member is subjected is not so heavy as to damage with time said elastic member.

[0005] In fact, whichever elastic member, if subjected to a heavy stretching load, suffers damage with time with a reduction of the elastic constant.

[0006] If the standstill during which the arm is stored in the bent position and the elastic member is subject to the maximum load is limited in time, for example one night or a few days, the elastic member remains undamaged.

[0007] If, on the contrary, standstills are longer, the arm may lose part of its functionality and should be replaced, as articulated arms are built using box-like members and parts which are irreversibly fixed and cannot be disassembled to replace the elastic member.

[0008] Said dangerous standstills are, for example, winter, when extremely cold temperatures facilitate the yielding of metal springs of elastic members, or storage periods before sale.

[0009] As it is known, awnings are sold in specific time of the year, which takes place during the pre-summer season. If awnings are not sold during the same season of their manufacture, they will most probably not be sold until the following season, when the articulated arms may have suffered severe functionality loss.

[0010] The technical problem which underlies the present invention is to provide an articulated arm as to overcome the drawbacks mentioned with reference to the prior art.

[0011] Said problem is solved by an articulated arm for the support and the extension of awnings, comprising:

- * a first and a second half-arms, connected at their respective close ends thereof by means of an intermediate joint, and each provided with a respective articulated end opposed to said close end, said first and second half-arm being movable between a non-operative bent position and an extended supporting position of the articulated arm; and

- * an elastic member, fastened to said first and second half-arms, which opposes to the bending of said articulated arm;

5 characterized in that it comprises loosening means of said elastic member, which are joined to one of said first or second half-arms, which is operable when said articulated is the bent position.

[0012] The main advantage of the articulated arm according to the present invention lies in the possibility of releasing said elastic member, thus preventing it from yielding during standstills.

[0013] The present invention will be hereinafter disclosed according to a preferred embodiment thereof, shown as a non-limiting example. Reference will be made to the figures of the annexed drawings wherein:

figure 1 shows a partly sectioned perspective view of an awning in its extended position, incorporating an articulated arm according to the present invention;

figure 2 shows a partly sectioned perspective view of the articulated arm of figure 1 in an operative mode;

figure 3 shows a partly sectioned perspective view of the articulated arm of figure 1 in a non-operative mode; and

figure 4 shows a partly sectioned perspective view from a different angle of a detail of the articulated arm of figure 1.

[0014] With reference in particular to figure 1, the outdoor awning of the type which is mounted on a vertical wall and is apt to extend in order to create a shady area, is indicated 1 as a whole.

[0015] It comprises a winding roller 2, rotatably connected to the vertical wall at its ends, which is provided with rotating means 3 of the passive kind, i.e. that can to rotate the roller in each of the two rotation directions only when it is outerly operated by means of a hook 4 and a rod, not shown.

[0016] Opposed to the roller 2, which is horizontally mounted, is a horizontal bar 5 which can be operated, as it will be made clear herebelow, so as to be approached or moved away from said roller 2.

[0017] A cloth 6, which is wound around the roller 2 and is fastened as usual to the bar 5, extends between the roller 2 and the bar 5. In order to keep the cloth 6 always extended, the awning 1 comprises elastic return means which, as it will be made clear herebelow, operate independently from said rotating means 3 of the winding roller 2.

[0018] Moreover, the awning 1 comprises a pair of supporting arms 7, symmetrically placed at the sides of the cloth 6, which can extend and be bent in order to wind and unwind the awning 1.

[0019] According to the present invention every supporting arm 7 that, in this preferred embodiment are

identical, have a first and a second half-arm, respectively indicated 8 and 9.

[0020] The half-arms 8, 9 consist of an elongated box-like member 10 which is hollow. They are connected therebetween along respective first and second close ends 11 and 12 by an intermediate joint 13 comprising a first vertical-axis rotating pin 14. The intermediate joint 13 defines a bending whose inner side is oriented toward the outside of the awning 1.

[0021] Both close ends 11,12 are open at their respective hollow sections defined by the box-like member 10.

[0022] The arm 7 comprises a first articulated end 15, opposed to the first close end 11 of the first half-arm 8, and a second articulated end 16, opposed to the second close end 12 of the second half-arm 9.

[0023] The second articulated end 16 is rotatably connected to the horizontal bar, while the first articulated end, is rotatably connected to a supporting member 17 apt to be fastened to the wall in a suitable position.

[0024] The first articulated end 15 comprises an articulation member 18 which has a bushing 19 having a vertical axis. The articulation member 18, made of metal, is simply forced inside the box-like member 10, which is also metallic, closing the corresponding opening.

[0025] The bushing 19 houses a second rotating pin 20, connected to the supporting member 17.

[0026] According to the present invention the elastic return means of arms 7 formed by an elastic member, indicated 21 as a whole, which is joined to said first and second half-arm 8,9.

[0027] The elastic member 21 is of the elongated type and comprises a first end 22 which is connected to the first half-arm 8 at the articulation member 18, and a second end 23 which is connected to the second half-arm 9 at a point thereof, for example the second articulated end 16.

[0028] The elastic member 21 comprises an helical spring 24 connected to a flexible member 25, in particular a roller chain.

[0029] The helical spring 24 is entirely housed inside the first half-arm 8 in the respective box-like member 10. It ends with a hook 26 connected to the first link of the roller chain 25 which is housed inside said first and second half-arms 8,9 in their respective box-like members 10. The chain 25 runs through the opened close ends 11,12 and it is in contact with the first rotating pin 14 on the outer side of the bending between the first and the second half-arm.

[0030] The elastic member 21 is stretched between its ends 22, 23. Therefore, it tends to assume the configuration of lesser length, or extension, pressing the first rotating means 14 to a direction which proceeds from the outer to the inner side of the bending. In other words, the elastic member 21 opposes to the bending of the arm 7 and tends to keep the half-arms 8,9 in the

position which is closer to their reciprocal alignment, i.e. in the extended position supporting the bar 5 and the cloth 6.

[0031] The arm 7 according to the invention comprises, as it will be made clearer herebelow, loosening means 27 of said elastic member 21 which in the present embodiment are joined to the first half-arm 8.

[0032] In the present embodiment, said loosening means are provided with a screw coupling indicated 27 as a whole, of, for example, the open-sleeve type. The latter is located next to the first articulated end 15.

[0033] The screw coupling 27 comprises a first screw 28, engaged to a first end 29 of the sleeve which is indicated 30. The first screw 28 is provided with a circular eye 31 which is hooked to the helical spring 24 by a second hook 32.

[0034] The first screw 28 is actually secured or fastened to the respective first end 29 of the sleeve 30. Instead of said screw, the screw coupling can comprise a connecting member integrally built with the sleeve 30 however, in order to use the standard screw couplings which are easily available on sale, it is sufficient to skillfully break the thread of the first screw 28 in order to prevent it from turning, acting so that its transmission efficiency is lower than the transmission efficiency of the second screw coupling screw indicated 33.

[0035] The second screw 33 is engaged to the second end 34 of the sleeve 30. It is provided with an Allen head 35 which is secured into a first flared hole 36; drilled through the articulation member 18 and the bushing 19. The Allen head 35 is free to rotate in the first hole 36 which is opened into the opening of the bushing 19.

[0036] The bushing 19 is provided with a second hole 37 opposed to the first hole 36. Obviously, the holes 36, 37 are continuously aligned with the axis of the screw coupling 27, with the first half-arm 8 and with the portion of the elastic member 21 which is housed inside the first half-arm 8.

[0037] The pin 20 is also provided with a third hole 38 corresponding to said first and second holes 36, 37. Said holes 36, 37, 38 make up, when they are aligned, an access opening to the Allen head 35; an Allen wrench B can be inserted through this opening in order to reach the screw coupling 27, i.e. the loosening means of the arm 7.

[0038] The loosening means can be operated when the arm 7 is in its non-operative bent position, i.e. it is possible to go through said access opening 36,37,38 when the first half-arm 8 and the second half-arm 9 closely bent and parallel therebetween (figures 2, 3) and to the horizontal bar 5, to the winding roller 2 and to the wall, not shown.

[0039] To this purpose, the third hole 38, of the cylindrical type, has a fixed axis which is parallel to the first half-arm 8 when the arm 7 is in the bent position, allowing the alignment of the holes 36,37,38 only in this particular position.

[0040] In said position it is possible, by operating on the Allen head 35 by means of the wrench B or by a similar tool, to loosen the elastic member 21 from an operative position, which in the bent positions corresponds to the maximum load applied to said elastic member 21, to an unloaded position of partial loosening wherein the elastic features of the elastic member 21, and in particular the helical spring 24, are not deteriorated.

[0041] When the member 21 is in its operative position, it is possible to maneuver the awning 1 by acting on the rotating means 3 in the usual way. The elastic return means, consisting of the elastic members 21 of each arm 7, cooperate in unwinding the same awning 1 and to keep the cloth 6 extended.

[0042] During the operative period of the awning 1, for example in summer, the awning is kept constantly unwound or it is subjected to an unwinding-winding cycle corresponding, for example, to the day-night cycle.

[0043] Therefore, during the operative period, the elastic member 21 is seldom subjected to the maximum load and anyway for limited periods of time.

[0044] The standstill period of the awning 1 is for example winter, or the period before sale or also, and this is the longest period of all, if the awning is not sold during the top selling season, i.e. before summer, and remains unsold until the following top selling season.

[0045] During such standstill periods the awning 1 is usually stored with the arms 7 in a completely bent position: in this case, in order to prevent the damaging of the elastic member 21, it is sufficient to operate the loosening means 27 and move the elastic member 21 to the unloaded position.

[0046] This loosening operation can be carried out directly at the factory, while the elastic member 21 will be placed in its operative position after sale. Furthermore, the elastic member 21 will have to be loosened during maintenance operations, scheduled during the season which immediately follows summer.

[0047] The articulated arm described above can rely to different embodiments which would anyway fall within the scope of the present invention.

[0048] In particular, the articulated arm can be of the type comprising a plurality of articulated half-arms, provided with one or more elastic members to be loosened.

[0049] Furthermore, the elastic member can be modified in its shape and position in order to meet different requirements of structural setting. In a similar way the loosening means can form a part of the elastic member which can be placed in different positions, not only in proximity of the winding roller but also, for example, in proximity of the horizontal bar or the intermediate joint.

[0050] The screw coupling can be replaced by similar loosening systems, such as a releasing and hooking system provided with hollows or other limit stops.

[0051] Besides the above-mentioned advantage,

the articulated arm can be made with simple modifications of extremely low design impact and low costs.

[0052] Moreover, it can also be used to adjust the load to which the elastic member is subjected. Such adjustment can be carried out at the factory, and allows the use of standard helical springs suiting different articulated arms instead of calibrated springs.

[0053] In order to meet further contingencies, a man skilled in the art will be able to provide the above-described articulated arm with further different variations and all of them, however, falling within the protective scope of the present invention, as defined by claims annexed hereinafter.

Claims

1. . An articulated arm (7) for the support and extension of awnings (1) comprising:
 - * a first and a second half-arm (8, 9), connected at respective close ends (11, 12) by means of an intermediate joint (13) and each provided with a respective articulated end (15, 16) opposed to said close end (11, 12) said first and second half-arm (8, 9) being movable between a non-operative bent position and an extended, supporting position of the articulated arm (7); and
 - * an elastic member (21) connected to said first and second half-arm (8, 9) which opposes to the bending of said articulated arm (7); characterized in that it comprises:
 - * loosening means (27) of said elastic member (21) which are joined with said first or second half-arm (8,9), which are operable in the bent position of said articulated arm (7).
2. The articulated arm (7) according to claim 1, wherein the elastic member (21) is of the elongated type.
3. The articulated arm (7) according to claim 2, wherein said first and second half-arm (8, 9) are formed by an elongated box-like member, said elastic member (21) being housed inside said first and second half-arms (8, 9).
4. The articulated arm (7) according to claim 3, wherein said elastic member (21) comprises an helical spring (24) housed inside said first half-arm.
5. The articulated arm (7) according to claims 3 or 4, wherein said intermediate joint (13) defines a bending and comprises a pin (14), said elastic member (21) having a first end (22) connected to the first half-arm (8), and a second end (23) connected to the second half-arm (9), and being in contact with said pin (14) at the inner side of the bending.

6. The articulated arm (7) according to claim 5, wherein said elastic member (21) comprises a flexible member (25) which is in contact with said pin (14). 5
7. The articulated arm (7) according to claim 6, wherein said flexible member comprises a roller chain (25). 10
8. The articulated arm (7) according to one of preceding claims, wherein said loosening means comprise a screw coupling (27). 15
9. The articulated arm (7) according to claim 8, comprising a first and a second articulated end (15, 16) of said first and second half-arm (8,9) respectively, said screw coupling (27) being placed next to one of said articulated ends (15, 16) which comprises an articulation member (18) presenting an opening (36, 37, 38) which can be accessed in order to operate said screw coupling (27) when the articulated arm (7) is in the bent position. 20
10. The articulated arm (7) according to claim 9, wherein said articulation member (18) comprises a bushing (19) which houses a rotating pin (20), said bushing having a first and a second hole (36, 37) aligned with the turnbuckle's (27) axis and said rotating pin (20) having, at said first and second hole (36, 37) a third cylindrical hole (38) whose axis is parallel to one of said first and second half-arms (8, 9), which corresponds to said articulation member (18) when the articulated arm (7) is in its bent position, said first, second and third hole being in alignment therebetween when the arm (7) is in its bent position so to realize said opening. 25
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11. The articulated arm (7) according to claim 10, wherein said articulation member is located at said first articulated end (15). 40
12. The articulated arm (7) according to one of claims 8 to 11, wherein said screw coupling comprises a sleeve (30) and a screw (28) having a secured head which is free to rotate inside said first hole (36) of the bushing (19). 45
13. The articulated arm (7) according to claim 12, wherein the sleeve (30) is an open sleeve. 50
14. The articulated arm (7) according to claim 12, wherein the head (35) is an Allen head. 55
15. An awning (1) comprising at least one articulated arm (7) according to any of preceding claims. 55

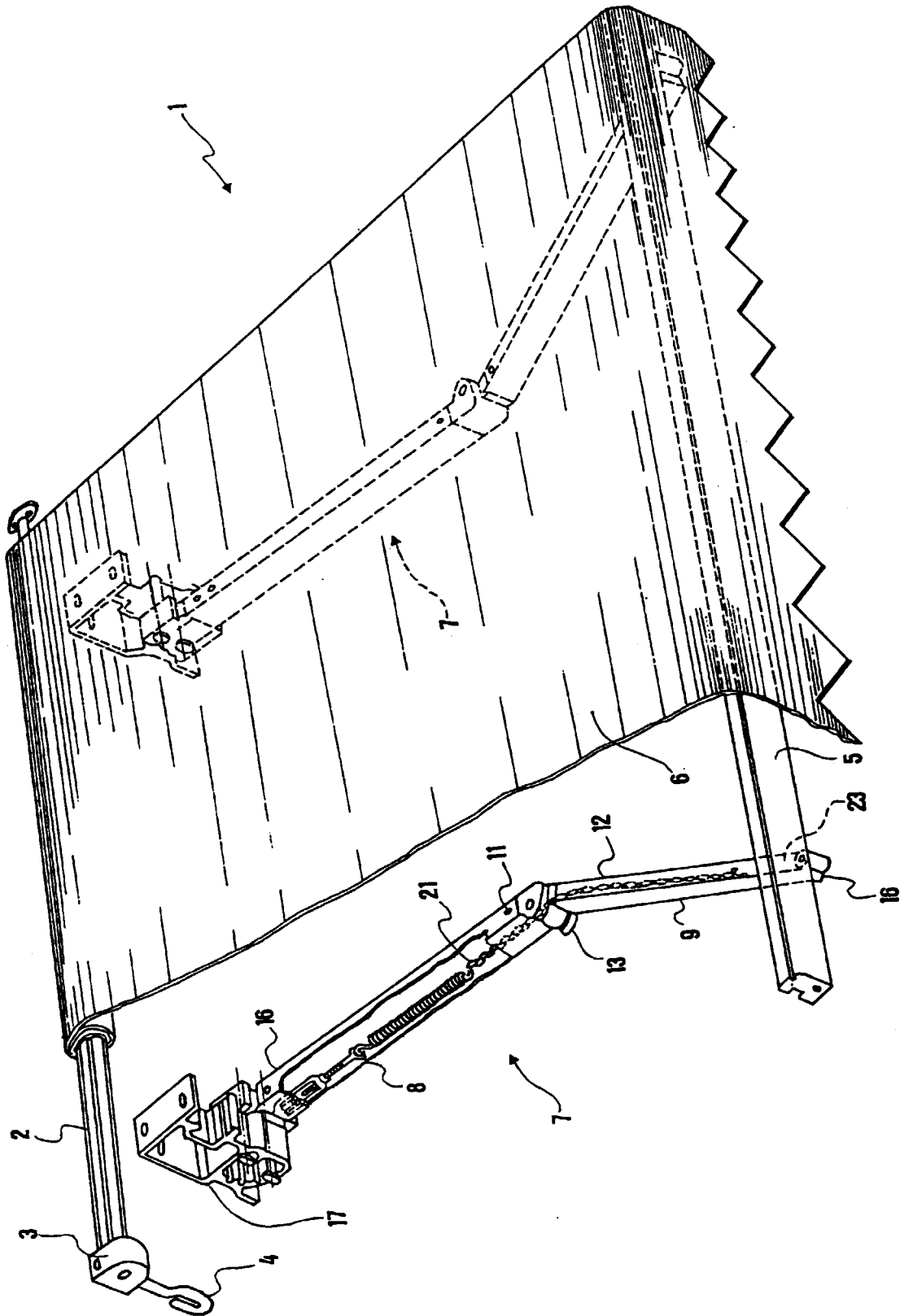
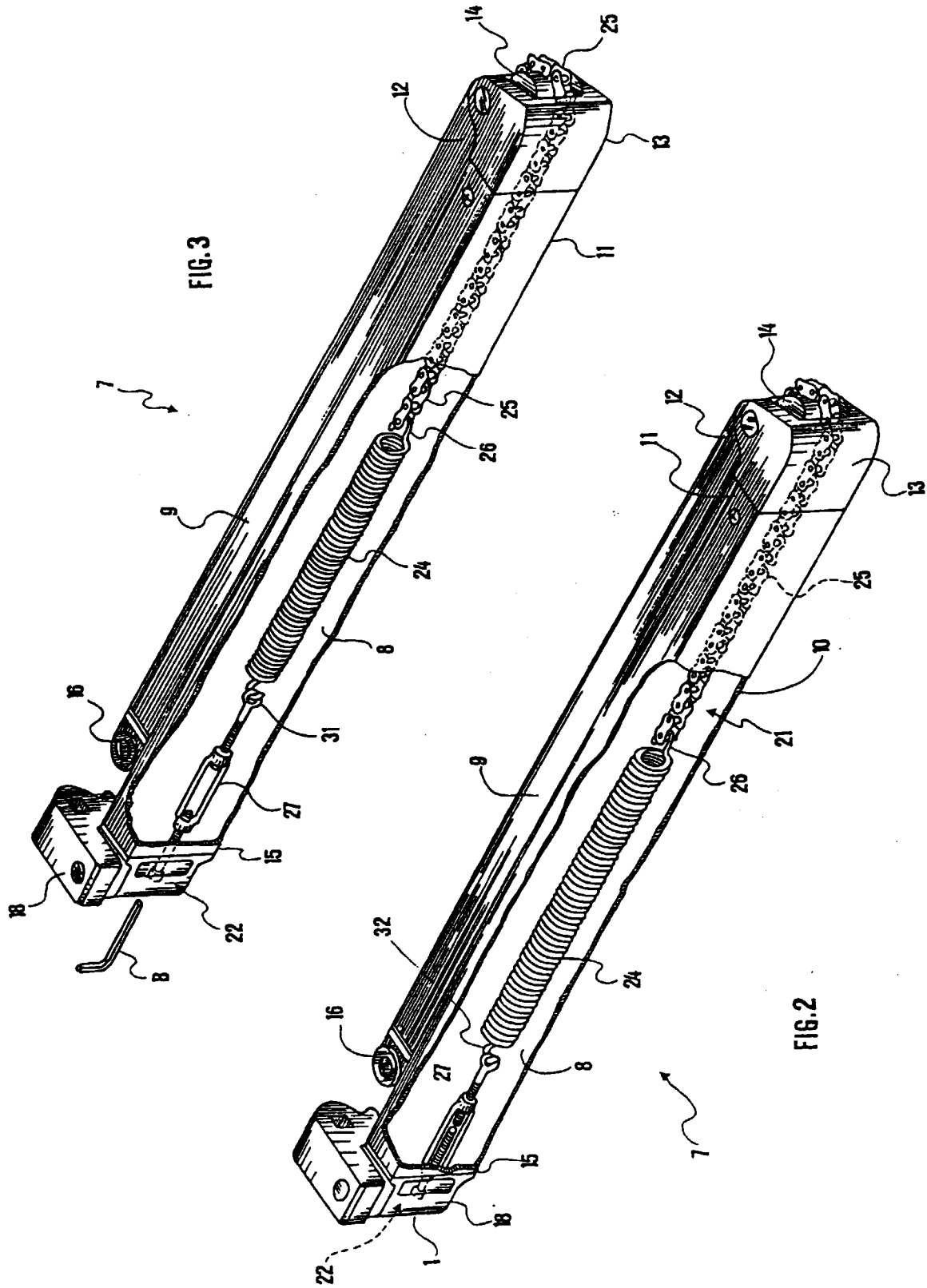


FIG. 1



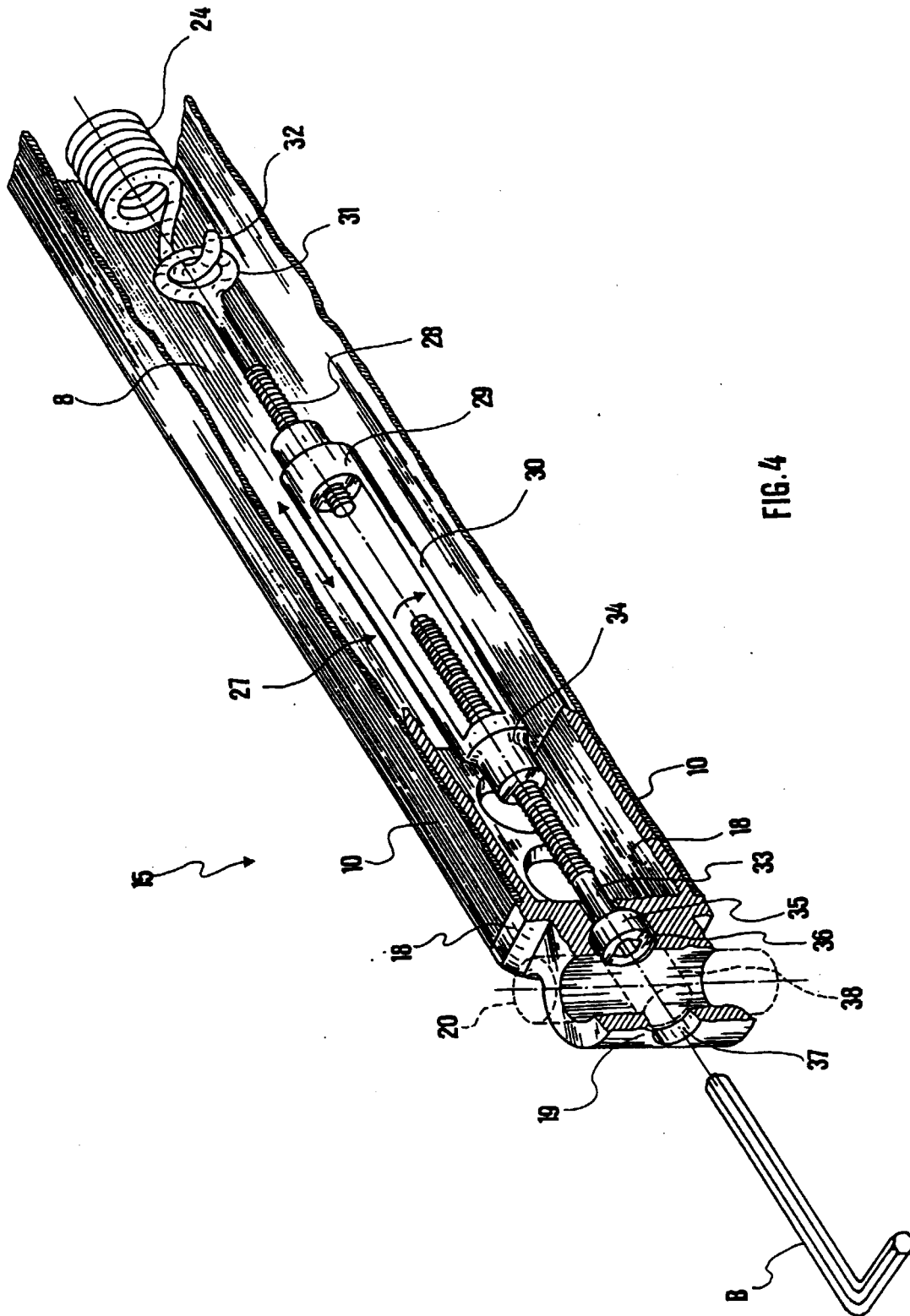


FIG. 4



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 98 83 0784

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.6)
X	US 2 252 109 A (ACKERMAN) 12 August 1941	1-8,11, 15	E04F10/06
A	* the whole document * ---	9,12	
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			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			E04F
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 25 May 1999	Examiner Vijverman, W
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 98 83 0784

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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25-05-1999

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