



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
20.08.2014 Bulletin 2014/34

(51) Int Cl.:
E04F 10/06 (2006.01)

(21) Application number: **14154927.9**

(22) Date of filing: **12.02.2014**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

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(30) Priority: **13.02.2013 IT PD20130034**

(54) **Awning with two rotatable articulated arms**

(57) Awning with arms which comprises a rolling-shutter box (2) for containing a rollable cloth (3), and at least two articulated arms (10) movable between an extended position and a retracted position and connected to the rolling-shutter box (2) by means of corresponding tiltable support devices (11). Each of such support devices (11) comprises: a support body (12) fixed to the rolling-shutter box (2); a tiltable body (13) which rotatably supports the corresponding articulated arm (10) and is rotatably connected to the support body (12) in order to rotate around a first horizontal rotation axis (X) between an upper position and a lower position; an adjustment element (16) constrained to the support body (12) and provided with a stop portion (17) which is inserted in a guide (18) obtained in the tiltable body (13) and is adapted to receive in abutment an abutment portion (19) of the tiltable body (13) arranged in the lower position in order to stop the downward rotation of the latter.

In addition, each support device (11) comprises a locking body (20) rotatably constrained to the tiltable body (13) in order to rotate around a second rotation axis (Y), and provided with an interception portion (21) and a control portion (22) by means of which the corresponding articulated arm (10) drives the locking body (20) in rotation between a non-interference position, in which the interception portion (21) is outside the guide (18) of the tiltable body (13) in order to allow the free passage of the stop portion (17), and an interference position, in which the interception portion (21) projects into the guide (18) of the tiltable body (13) in the lower position, and is adapted to abut against the stop portion (17) in order to prevent the rotation of the tiltable body (13) towards the upper position.

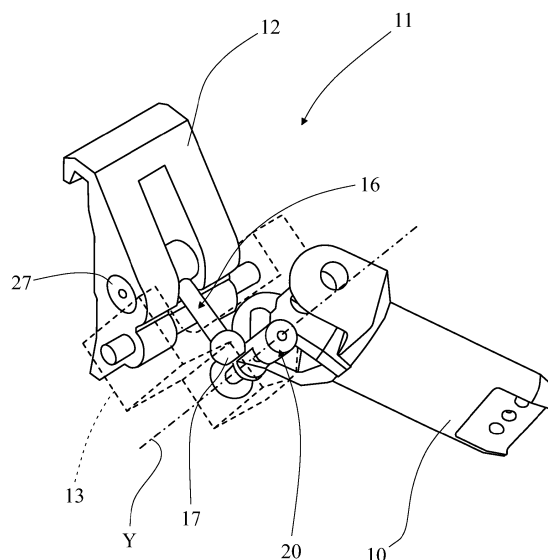


Fig. 5

Description

Field of application

[0001] The present invention regards an awning with arms, according to the preamble of the independent claim number 1.

[0002] The present awning is intended to be advantageously employed for covering external surfaces, protecting them from weathering agents and particularly from the sun and rain. More in detail, the present awning is preferably intended to be fixed to the wall of a building above an opening, such as a door or a window, in order to cover an external surface adjacent to the wall itself and accessible from the opening, such as a terrace or a garden, a veranda, etc.

[0003] The present awning is therefore intended to be inserted in the industrial field of production of home accessories, in the field of doors/windows/shutters and in the field of production of cloths for sun protection and similar applications.

State of the art

[0004] Known on the market are awnings with arms provided with a horizontal support bar fixed to a wall of a building by means of two or more fixing brackets and bearing a rotatable roller mounted thereon, on which a cover cloth is wound, and two or more articulated arms connected to the cloth in order to stretch it when the latter is unwound from the rotatable roller.

[0005] More in detail, the cloth is fixed with a rear edge thereof to the rotatable roller and with a front edge thereof to a transverse bar, and is movable, following the rotation of the rotatable roller, between a closed position, in which the cloth is wound around the roller, and an open position, in which the cloth is unwound from the roller to cover the underlying surface.

[0006] In addition, the articulated arms of the awning are provided with a first end hinged to the support bar and with an opposite second end hinged to the aforesaid transverse bar, and they are movable between an extended position, in which they push the transverse bar away from the rotatable roller in order to stretch the cloth in the open position, and a retracted position, in which their second end connected to the transverse bar is brought adjacent to the roller when the cloth is arranged in the closed position.

[0007] More in detail, the first end of each articulated arm of the awning is coupled to the support bar by means of an adjustable joint which allows adjusting, during the installation of the awning, the downward tilt of the articulated arms when they are in extended position, in order to determine the tilt of the open cloth as a function of the area of the underlying surface that one wishes to cover.

[0008] The main drawback of the awnings with arms of the type mentioned briefly above is due to the fact that the cloth, both in closed and open position, is always

exposed to weathering agents (such as rain, humidity, etc.) which facilitate a quick deterioration thereof.

[0009] In order to at least partly solve such drawback, awnings with arms have been known for some time on the market of so-called enclosed type, which are provided with a rolling-shutter containment box which at its interior houses the winding roller of the cloth in order to protect the latter from weathering agents when the cloth is in its closed position wound around the roller.

[0010] More in detail, the Italian patent No. 1366396 describes an enclosed awning embodiment in which the rolling-shutter containment box is fixed to the wall of the building by means of fixing brackets, and is provided with a front opening in order to allow the passage of the cloth and of the articulated arms when the cloth of the awning is in the open position.

[0011] The articulated arms of the awning are hinged at their first end, by means of a connection pin, to the rolling-shutter box and carry mounted at their second end a front profile which, when the cloth is brought into the closed position, is arranged by the articulated arms in retracted position to close the front opening of the rolling-shutter box.

[0012] In particular, the connection pins of the articulated arms of the awning are fixed in a rigid manner to the rolling-shutter box, without allowing any variation of the vertical tilt of the arms with respect to the rolling-shutter box, in order to ensure the correct coupling of the front profile with the edge of the front opening of the rolling-shutter box when the articulated arms are brought into the retracted position with the cloth in the closed position.

[0013] In order to adjust the tilt of the cloth in the open position, it is necessary to rotate the entire rolling-shutter box, which for such purpose is connected to the fixing brackets by means of the adjustment pins and is positionable in the desired tilt by means of a connecting rod fixed at one end to the adjustment pin and at the other end to the pawl slidable inside a guide obtained in the fixing bracket by means of screw-nut screw mechanism.

[0014] A first drawback of the enclosed awning of the type described in the Italian patent No. 1366396 is due to the fact that the rolling-shutter box must be positioned spaced from the wall of the building on which the awning is mounted, in order to allow the rotation of the rolling-shutter box itself, in this manner allowing the rain that passes through the interspace between the rolling-shutter box and the wall of the building to reach the surface below the awning.

[0015] A further drawback of the enclosed awning of the type described above is due to the fact that the connection of the rolling-shutter box to the brackets and the adjustment of its tilt by means of the connecting rod connected to the slidable pawl require high structural complexity of the awning, with consequent high production costs.

[0016] In order to at least partly solve these drawbacks, enclosed awnings with arms have been known on the

market for some time in which the rolling-shutter box is rigidly fixed adjacent to the wall of the building, and the articulated arms are connected to the rolling-shutter box by means of a tiltable support device which, during the opening and closing of the awning, is susceptible to rotate around a horizontal rotation axis in order to vary the tilt of the articulated arms in a manner such that, when the arms are in their retracted position, they are capable of bringing the front profile to correctly close the opening of the rolling-shutter box and, when the arms are in their extended position, arrange the cloth in the desired tilt.

[0017] For example, the patent NL 8902499 describes an awning with arms provided with a tiltable support device which comprises a support bracket fixed to the rolling-shutter box of the awning and a tiltable body hinged to the support bracket by means of a horizontal pin carrying the connection pin of the corresponding articulated arm fixed thereto. In addition, the support device comprises an adjustment screw inserted inside a through hole obtained in the tiltable body and orthogonal to the rotation axis of the device itself. Such adjustment screw is adjustably screwed in a threaded hole of a horizontal cylinder rotatably constrained to the support bracket, and is provided with an enlarged head susceptible to abut against an abutment of the tiltable body in order to stop the downward rotation of the latter at a specific tilt when the cloth of the awning is in the open position with the articulated arms in extended position.

[0018] In particular, by screwing or unscrewing the adjustment screw, it is possible to decrease or increase the distance of the head of the adjustment screw from the horizontal cylinder constrained to the support bracket, in this manner determining the stop position of the tiltable body when the articulated arms of the awning are brought into the extended position.

[0019] The main drawback of the awning with arms described in the patent NL 8902499 is due to the fact that possible gusts of wind, that pass below the cloth of the awning in open position, pushing it upward, can easily cause the upward rotation of the tiltable bodies of the support devices, determining consequent sharp oscillations of the articulated arms and of the cloth which can easily cause damage to the awning.

[0020] For the purpose of at least partly solving such drawback, awnings with arms are known on the market in which the tiltable support devices of the articulated arms are provided with locking mechanisms adapted to prevent the upward rotation of the tiltable body of the support devices themselves.

[0021] For example, the Italian patent No. 1324447 describes an awning with arms in which each tiltable support device comprises a locking rod which is slidable inserted in a horizontal hole of the tiltable body orthogonally intersecting the through hole in which the adjustment screw is inserted. Such locking rod is adapted to interfere with the head of the adjustment screw on the side opposite the abutment of the tiltable body in order to lock the head of the adjustment screw between the abutment and the

rod itself, in a manner so as to prevent the upward rotation of the tiltable body.

[0022] More in detail, the locking rod is connected at a first part thereof to a movement lever fixed to the corresponding articulated arm; such lever, following the movement of the articulated arm between its retracted and extended position, is adapted to move the locking rod between a non-interference position, in which the rod is arranged with an annular groove thereof at the through hole in order to allow the passage of the head of the adjustment screw during the rotation of the tiltable body, and an interference position, in which the locking rod is brought with its annular groove outside the first through hole in order to lock the head of the screw when the latter has abutted against the abutment of the tiltable body.

[0023] In addition, the support device is provided with a spring inserted in the horizontal hole of the tiltable body and compressed between a shoulder obtained in such horizontal hole and a second end part of the locking rod, opposite the first end part connected to the movement lever, for pushing the locking rod towards its interference position.

[0024] The main drawback of the awning with arms described in the Italian patent No. 1324447 is due to the fact that the arrangement of the locking rod slidably driven by the movement lever of the articulated arm, involves high structural complexity of the support device with consequent high production costs.

[0025] The patent EP 2447439 describes an awning with arms of known type in which the head of the adjustment screw of each tiltable support device is provided with an annular groove, in which the free end of the locking rod is susceptible to be engaged, when the latter is brought by the corresponding articulated arm into the interference position in order to lock the head of the screw itself and consequently prevent the upward rotation of the tiltable body.

[0026] The patent DE 102008062654 describes an awning with arms of known type in which the rotation pin of each articulated arm is provided, at one end thereof, with a semicircular projection which defines a flat surface engaged with a shoulder of the locking rod of the corresponding tiltable support device, in a manner such to move the locking rod into the interference position when the articulated arm is rotated towards the extended position.

[0027] The patent DE 4345069 describes an awning with arms of known type in which each tiltable support device comprises a threaded rod, which has one end hinged to the support bracket of the support device itself, and carries screwed, at the other end, an abutment head adapted to receive in abutment the tiltable support for limiting the downward tilt thereof and provided with a coupling seat in which a horizontal locking rod is susceptible to be engaged.

[0028] Such locking rod is drivable by the corresponding articulated arm to be moved between a non-interference position, in which the locking rod carries its reduced

portion in the coupling seat of the abutment head, in a manner such that the latter can be disengaged from the locking rod, making it exit from the coupling seat through an opening of the seat itself, and an interference position, in which the locking rod carries, inside the coupling seat of the abutment head, its enlarged portion of size greater than the opening of the coupling seat in a manner such to prevent the exit of the locking rod from the seat itself, for constraining the abutment head to the locking rod.

[0029] Also the tiltable support devices for the awnings of known type described in the latter documents EP 2447439, DE 102008062654 and DE 4345069 are quite complex structurally, since they are composed of numerous components provided with particular shaped forms in order to allow the actuation of the locking rod.

Presentation of the invention

[0030] In this situation, the problem underlying the present invention is to provide an awning with arms which is structurally simple and inexpensive to achieve.

[0031] A further object of the present invention is to provide an awning with arms which is entirely reliable in operation.

[0032] A further object of the present invention is to provide an awning with arms having the rolling-shutter box with limited size.

[0033] These and other objects are all achieved by the awning with arms according to the enclosed claims.

Brief description of the drawings

[0034] The technical characteristics of the invention, according to the aforesaid objects, can be clearly seen in the contents of the below-reported claims and the advantages thereof will be clearer from the following detailed description, made with reference to the enclosed drawings, which represent a merely exemplifying and non-limiting embodiment of the invention, in which:

- figure 1 shows a bottom plan view of the awning with arms, subject of the present invention, with the articulated arms in extended position;
- figure 2 shows a side view of the awning with arms, subject of the present invention, with the articulated arms in retracted position, in which some parts of the awning have been removed in order to better illustrate other parts;
- figure 3 shows a section view of a detail of the awning illustrated in figure 2 relative to a support device of each articulated arm, along the line III - III of figure 2 itself;
- figure 4 shows a section view of the support device illustrated in figure 3 along the line IV - IV of figure 3 itself;
- figure 5 shows a perspective view of the support device of each articulated arm in which the latter is in extended position, with the tiltable body of the sup-

port device represented transparent in order to better illustrate further parts of the support device itself;

- figure 6 shows a section view of the support device illustrated in figure 5.

Detailed description of a preferred embodiment

[0035] With reference to the set of drawings, reference number 1 indicates overall the awning with arms, subject of the present invention.

[0036] The present awning with arms 1 is advantageously intended to be fixed to a wall of a building for adjustably covering a surface of the ground adjacent to the wall, protecting it from the sun, rain etc. In addition, the present awning 1 is preferably intended to be arranged above an opening, such as in particular a door, a window, a display glass or the like, obtained on the aforesaid wall in order to protect such opening from the sun.

[0037] With reference to the embodiment illustrated in the enclosed figures, the present awning 1 comprises a rolling-shutter box 2 for containing a reliable cloth 3, such rolling-shutter box 2 intended to be fixed to the wall of the building and provided with a front opening 4 for the passage of the aforesaid cloth 3.

[0038] More in detail, the rolling-shutter box 2 comprises a rear wall 5, preferably provided with anchorage brackets 6 by means of which it is fixable adjacent to the wall of the building, and a front wall 7 on which the front opening 4 is obtained which is intended to be closed by a front profile 8 of the awning 1 when the cloth 3 is closed, as described in detail hereinbelow.

[0039] In addition, inside the rolling-shutter box 2, a roller 9 is rotatably housed, on which the cloth 3 of the awning 1 is susceptible to being wound and unwound.

[0040] In particular, the cloth 3 has a preferably rectangular form, and is provided with a first end edge fixed to the roller 9 and with a second end edge opposite the first end edge and fixed to the front profile 8.

[0041] Functionally, the roller 9 of the awning 1 can be driven to rotate around its horizontal axis by means of a motor or in a manual manner (for example by means of a control rod engaged through a joint to the shaft of the roller 9), in order to unwind or wind the cloth 3 around the roller 9 itself. More in detail, the cloth 3 can be moved between an open position (illustrated in the embodiment of figure 1), in which the cloth 3 is at least partially unwound from the roller 9 outside the rolling-shutter box 2 through the aforesaid front opening 4, and a closed position (illustrated in the embodiment of figure 2) in which the cloth 3 is wound around the roller 9 and the front profile 8 is brought to close the front opening 4 of the rolling-shutter box 2.

[0042] According to the invention, the awning 1 comprises at least two articulated arms 10, each provided with a first end 10' constrained to the rolling-shutter box 2 and with a second end 10'' bearing the front profile 8 mounted thereon. The articulated arms 10 are movable

between an extended position, in which the articulated arms 10 are at least partially extended outside the rolling-shutter box 2 through the front opening 4 in order to stretch the cloth 3 in open position, and a retracted position, in which the articulated arms 10 are retracted inside the rolling-shutter box 2 and arrange the front profile 8 to close the front opening 4 of the rolling-shutter box 2 when the cloth 3 is wound in closed position around the roller 9.

[0043] In particular, each articulated arm 10 comprises two tubular sections hinged to each other at a central elbow of the arm 10 itself, and preferably comprises elastic extension means, constituted for example by elastic transmissions arranged inside the tubular sections in a manner *per se* known to the man skilled in the art, which are arranged for exerting, on the corresponding articulated arm 10, an elastic force that tends to bring the articulated arm 10 into the extended position.

[0044] More in detail, functionally, when the cloth 3 is unwound from a roller 9 in order to be brought into its open position, the elastic extension means of each articulated arm 10 push the second end 10" (which bears the front profile 8 of the awning 1 mounted thereon) of the corresponding articulated arm 10 away from the first end 10' (constrained to the rolling-shutter box 2) in a manner such to move the articulated arms 10 towards the extended position, tensioning the cloth 3 which is fixed with its second end edge to the front profile 8.

[0045] When the cloth 3 is wound around the roller 9 in order to be brought back from the open position to the closed position, the cloth 3 being wound pulls the front profile 8 of the awning 1 towards the rolling-shutter box 2 and consequently pulls the second ends 10" of the articulated arms 10 towards the first ends 10', overcoming the elastic force of the elastic return means of the articulated arms 10 in order to bring the latter back into the retracted position.

[0046] In addition, the awning 1 comprises at least one tiltable support device 11, and preferably at least two of such devices 11, each of which placed to connect between the rolling-shutter box 2 and a corresponding arm of the aforesaid articulated arms 10. More in detail, each support device 11 comprises a support body 12 mechanically fixed to the rolling-shutter box 2 and a tiltable body 13, which rotatably supports the corresponding articulated arm 4, by means of preferably a first hinge 14 connected to the first end 10' of the articulated arm 10 itself, and is rotatably connected to the support body 12 in order to rotate around a first substantially horizontal rotation axis X, preferably by means of a second hinge 15.

[0047] Advantageously, in accordance with the embodiment illustrated in figure 2, the support body 12 of each support device 11 is fixed to the rear wall 5 of the rolling-shutter box 2, or, in accordance with a different, non-illustrated embodiment, the support body 12 is fixed to the anchorage brackets 6 in the case, for example, in which the rear wall 5 of the rolling-shutter box 2 is at least partially open.

[0048] According to the invention, each support device 11 of the awning 1 comprises in addition an adjustment element 16 constrained to the support body 12 and provided with a stop portion 17 which is inserted in a guide 18 obtained in the tiltable body 13. The latter is adapted to rotate around the first rotation axis X between at least one upper position (illustrated in the embodiments of figures 2 - 4), in which the articulated arms 10 are in the retracted position, and at least one lower position (illustrated in the embodiments of figures 5 and 6), in which the articulated arms 10 are in the extended position and the stop portion 17 of the adjustment element 16 is in abutment against an abutment portion 19 of the tiltable body 13 inside the guide 18 in order to stop the downward rotation of the tiltable body 13 itself.

[0049] In particular, the upper position of the tiltable body 13 of each support device 11 is arranged with an angle such that the articulated arms 10 in their retracted position arrange the front profile 8 of the awning 1 in abutment against the edge of the front opening 4 of the rolling-shutter box 2; such position is determined during design step as a function of the structural characteristics of the awning 1, such as the width of the front opening 4, the length of the arms 10, the size of the rolling-shutter box 2, etc.

[0050] The lower position of the tiltable body 13 of each support device 11 is selected in order to determine the tilt of the articulated arms 10 in their extended position and hence the tilt of the cloth 3 of the awning 1 in the open position, as a function for example of the area of the ground surface that one wishes to cover. Such lower position is for example determined during installation, or even after installation in order to modify the tilt of the open cloth 3, by acting on the adjustment element 16 of each support device 11, as will be described in detail hereinbelow.

[0051] In accordance with the idea underlying the present invention, each support device 11 of the awning 1 comprises, in addition, a locking body 20 which is rotatably constrained to the tiltable body 13 in order to rotate around a second rotation axis Y, and preferably positioned in proximity to the guide 18 in which the adjustment element 16 is inserted. The aforesaid locking body 20 is provided with an interception portion 21, intended to interfere with the stop portion 17 of the adjustment element 16, and with a control portion 22 susceptible to mechanically engage with the corresponding articulated arm 10. The latter, in moving between its retracted position and its extended position, drives the locking body 20 in rotation, by means of the engagement with the aforesaid control portion 22, between a non-interference position, in which the interception portion 21 of the locking body 20 is outside the guide 18 of the tiltable body 13 in order to allow the free passage of the stop portion 17 of the adjustment element 16 for the movement of the tiltable body 13 between the upper and lower position, and an interference position, in which the interception portion 21 projects into the guide 18 of the tiltable body 13 arranged

in the lower position, and is adapted to abut against the stop portion 17 of the adjustment element 16 in order to prevent the rotation of the tiltable body 13 towards the upper position.

[0052] In this manner, when the articulated arms 10 of the awning 1 are in extended position for stretching the cloth 3 in the open position (with the tiltable body 13 of the support devices 11 arranged in the lower position), the locking body 20, arranged in the interference position, prevents the upward rotation of the tiltable body 13 in a manner such to prevent possible wind gusts, which penetrate below the cloth 3, from lifting the cloth 3 and the articulated arms 10 themselves upward.

[0053] Advantageously, when the tiltable body 13 of each support device 11 is in its lower position, the interception portion 21 of the locking body 20 arranged in the interference position is in abutment against the stop portion 17 of the adjustment element 16 on the opposite side with respect to the abutment portion 19 of the tiltable body 13 itself, in a manner such that the stop portion 17 is retained between the abutment portion 17 of the tiltable body 13 and the interception portion 21 of the locking body 20. Advantageously, the guide 18 of the tiltable body 13 of each support device 11 is extended away from the support body 12 between the abutment portion 19 and at least one locking portion 23 at which the interception portion 21 of the locking body 20 in interference position enters into the guide 18. Such locking portion 23 of the guide 18 is placed further away from the support body 12 with respect to the abutment portion 19, in a manner such that, when the tiltable body 13 is moved from the upper position to the lower position, it rotates away from the support body 12 towards the front opening 4 of the rolling-shutter box 2.

[0054] Advantageously, the guide 18 is arranged substantially orthogonal to the second rotation axis Y of the locking body 20 and is preferably obtained with a slide hole obtained in the tiltable body 13 and being extended, preferably in a through manner, between a rear face 24 of the tiltable body 13, directed towards the support body 12, and a second front face 25 of the tiltable body 13 directed towards the front profile 8 of the awning 1.

[0055] In accordance with the particular embodiment illustrated in the enclosed figures, the adjustment element 16 comprises a rod 26 which is hinged at a first terminal part 26' thereof to the support body 12, by means of a connection pin 27 having a third rotation axis W substantially parallel to the first rotation axis X of the tiltable body 13, and bears fixed, at an opposite second terminal part 26", the stop portion 17 preferably with enlarged form with respect to the rod 26 itself.

[0056] In particular, the rod 26 is provided with a thread by means of which it is screwed in an adjustable manner in a threaded hole 28 obtained transversely on the connection pin 27. More in detail, advantageously, the rod 26 of the adjustment element 16 can be screwed or unscrewed into the threaded hole 28 of the connection pin 27, in a manner such to be able to adjustably determine

the distance of the stop portion 17 (fixed to the second terminal part 26" of the rod 26) from the connection pin 27 itself, in this manner determining the tilt angle of the tiltable body 13 when it is in the lower position with the abutment portion 19 which abuts against stop portion 17 of the adjustment element 16. In accordance with the embodiment illustrated in the figures 4 and 6, the abutment portion 19 of the tiltable body 13 is preferably arranged between the support body 12 of the corresponding support device 11 and the stop portion 17 of the adjustment element 16 and is preferably obtained with a shoulder of the guide 18 which reduces the width of the guide 18 itself, in order to lock the stop portion 17, with enlarged form, allowing the passage of the rod 26.

[0057] Advantageously, when the locking body 20 is in the non-interference position, the guide 18 of the tiltable body 13 of each support device 11 is slidably movable with respect to the adjustment element 16 between the aforesaid upper and lower positions of the tiltable body 13 itself.

[0058] Functionally, when the cloth 3 of the awning 1 is in the closed position, with the articulated arms 10 in the retracted position, the tiltable body 13 of the support devices 11 is in the upper position with the locking body 20 in the non-interference position. When the cloth 3 is unwound from the roller 9 in order to be brought into the open position, the tiltable body 13 of the support devices 11, due to the weight of the corresponding articulated arm 10 constrained thereto, is rotated downward from the upper position to the lower position in which the abutment portion 19 of the tiltable body 13 abuts against the stop portion 17 of the adjustment element 16.

[0059] When the tiltable body 13 of each support device 11 has reached the lower position, the movement of the corresponding articulated arm 10 from the retracted position to the extended position determines, by means of the engagement of the articulated arm 10 with the control portion 22 of the locking body 20, the rotation of the latter from the non-interference position to the interference position. In the latter position, the interception portion 21 of the locking body 20 locks the sliding of the guide 18 of the tiltable body 13 (with respect to the adjustment element 16) close to support body 12 of the corresponding support device 11, in order to prevent the upward rotation of the tiltable body 13.

[0060] When the cloth 3 is wound around the roller 9 in order to be brought into the closed position, the articulated arms 10, which are consequently driven to be moved from the extended position to the retracted position, rotate the locking body 20 of the corresponding support devices 11 from the interference position to the non-interference position in order to allow the relative sliding of the guide 18 of the tiltable body 13 towards the support body 12.

[0061] The tiltable body 13, therefore, is rotated upward closer to the support body 12 from the lower position to the upper position, in which preferably the tiltable body 13 abuts against the support body 12 in particular with

an adjustment setscrew 40 screwed into a through hole 41 of the tiltable body 13 and projecting from the rear face 24 of the tiltable body 13 directed towards the support body 12 (in accordance with the embodiment illustrated in figure 4).

[0062] In accordance with the embodiment illustrated in the enclosed figures, the first end 10' of each articulated arm 10 of the awning 1 is hinged to the tiltable body 13 by means of the aforesaid first hinge 14 having a fourth rotation axis Z orthogonal to the first rotation axis X of the tiltable body 13.

[0063] Advantageously, the second rotation axis Y of the tiltable body 13 of each support device 11 is parallel to the fourth rotation axis Z of the corresponding articulated arm 10.

[0064] Advantageously, the locking body 20 of each support device 11 comprises a locking pin 29 arranged parallel to the second rotation axis Y and rotatably inserted in a housing hole 30 obtained in the tiltable body 13 and transversely intersecting the guide 18 preferably at the locking portion 23 of the latter.

[0065] Advantageously, in accordance with the embodiment illustrated in figure 3, the locking pin 29 of the locking body 20 is provided with an annular groove 31 in which a pin 32 is inserted that is fixed to the tiltable body 13 in order to rotatably support the locking pin 29 itself in the housing hole 30.

[0066] Advantageously, in accordance with the embodiment illustrated in the figures 4 and 6, the locking pin 29 is shaped with a transverse groove 33 partially delimited by the interception portion 21, which is preferably obtained with a sector of the locking pin 29 itself. In particular, the transverse groove 33 of the locking pin 29 is obtained on the external surface of the latter, being extended around the second rotation axis Y for an arc of circumference of less than 180°.

[0067] In particular, the transverse groove 33 of the locking pin 29, when the latter is placed in the non-interference position, is positioned in the guide 18 of the tiltable body 13 and is susceptible to being traversed by the stop portion 17 of the adjustment element 16 in order to allow the free passage thereof through the guide 18 itself.

[0068] Advantageously, the control portion 22 of the locking body 20 of each support device 11 (which is engageable by the corresponding articulated arm 10 in order to rotate the locking body 20 itself) is projectingly extended from the locking pin 29 orthogonal to the second rotation axis Y of the locking body 20, and is preferably obtained with a setscrew fixed in a radial hole 34 obtained on the external surface of the locking pin 29. Advantageously, the control portion 22 of the locking body 20 is engaged in a sliding relationship on a shaped portion 35 of the first end 10' of the corresponding articulated arm 10. More in detail, preferably, the shaped portion 35 is provided with a first section 35', in particular substantially rectilinear, being projectingly extended from the first end 10' substantially radially with respect to the fourth rotation axis Z of the articulated arm 10 and in-

tended to receive in abutment the control portion 22 of the locking body 20 in the non-interference position (in accordance with the embodiment illustrated in figure 4), and with a second section 35'', with curved form and continuous with the first section 35', intended to receive in abutment the control portion 22 of the locking body 20 in the interference position (in accordance with the embodiment illustrated in figure 6).

[0069] Functionally, when the articulated arm 10 is driven to be moved from the retracted position to the extended position, the shaped portion 35 of the articulated arm 10 pushes the control portion 22 of the corresponding locking body 20 to rotate in a first rotation direction from the non-interference position to the interference position with the control portion 22 that follows the profile of the shaped portion 35 from its first rectilinear section 35' to its second curved section 35''.

[0070] Advantageously, each support device comprises elastic means 36 acting on the locking body 20 in order to rotate it towards the non-interference position.

[0071] More in detail, the elastic means 36 are arranged for forcing the locking body 20 to rotate in a second rotation direction (contrary to the first rotation direction with which the locking body 20 is brought into the interference position) in order to maintain the control portion 22 of the locking body 20 engaged on the surface of the shaped portion 35 of the corresponding articulated arm 10.

[0072] Functionally, when the articulated arm 10 is driven to be moved from the extended position to the retracted position, the elastic means 36 push the control portion 22 of the locking body 20 to rotate into the second rotation direction, maintaining the control portion 22 in abutment against the surface of the shaped portion 35 of the articulated arm 10; such control portion 22 therefore follows the profile of the shaped portion 35, sliding on the second curved section 35'' up to the first section 35'.

[0073] Preferably, the first section 35' of the shaped portion 35 of the articulated arm 10 receives in abutment the control portion 22 of the locking body 20 arranged in the non-interference position, opposed to the force exerted by the elastic means 36 in order to prevent a rotation of the locking body 20 in the second rotation direction beyond the non-interference position.

[0074] In accordance with the embodiment illustrated in figure 3, the elastic means 36 of each support device 11 comprise a spring 36', preferably helical, wound around a reduced terminal section of the locking pin 29 and fixed at one end thereof to the locking pin 29 itself and at the other end to a closure screw 37 fixed to close the housing hole 30 in which the locking pin 29 is inserted.

[0075] The invention thus conceived therefore attains the pre-established objects.

Claims

1. Awning with arms, which comprises:

- a rolling-shutter box (2) for containing a reliable cloth (3), intended to be fixed to a wall and provided with a front opening (4) for the passage of said cloth (3);
 - at least two articulated arms (10), each provided with a first end (10') constrained to said rolling-shutter box (2) and with a second end (10'') bearing a front profile (8) mounted thereon, such arms movable between an extended position in which said articulated arms (10) are at least partially extended outside said rolling-shutter box (2) through said front opening (4), and a retracted position, in which said articulated arms (10) are retracted inside said rolling-shutter box (2) and arrange said front profile (8) to close the front opening (4) of said rolling-shutter box (2);
 - at least one tiltable support device (11), which is placed to connect said rolling-shutter box (2) with a corresponding arm of said articulated arms (10), and comprises:

- a support body (12) mechanically fixed to said rolling-shutter box (2);
 - a tiltable body (13), which rotatably supports said corresponding articulated arm (10) and is rotatably connected to said support body (12) in order to rotate around a first substantially horizontal rotation axis (X);
 - an adjustment element (16) constrained to said support body (12) and provided with a stop portion (17) which is inserted in a guide (18) obtained in said tiltable body (13); said tiltable body (13) being adapted to rotate between at least one upper position, in which said articulated arms (10) are in said retracted position, and at least one lower position, in which said articulated arms (10) are in said extended position and the stop portion (17) of said adjustment element (16) is in abutment against an abutment portion (19) of said tiltable body (13) inside said guide (18) in order to stop the downward rotation of said tiltable body (13);

said awning with arms being **characterized in that** said support device (11) also comprises a locking body (20) which is rotatably constrained to said tiltable body (13) in order to rotate around a second rotation axis (Y), and is provided with an interception portion (21) and a control portion (22);

said articulated arm (10), in moving between said retracted position and said extended posi-

tion, driving said locking body (20) in rotation, by means of the engagement with said control portion (22), between a non-interference position, in which said interception portion (21) is outside the guide (18) of said tiltable body (13) in order to allow the free passage of said stop portion (17), and an interference position, in which said interception portion (21) projects into the guide (18) of said tiltable body (13) in said lower position, and is adapted to abut against said stop portion (17) in order to prevent the rotation of said tiltable body (13) towards said upper position.

2. Awning with arms according to claim 1, **characterized in that** the guide (18) of said tiltable body (13) is slidably movable with respect to said adjustment element (16) between said upper and lower positions, and is provided with an extension moving away from said support body (12) between its abutment portion (19) and a locking portion (23), in which the interception portion (21) of said locking body (20) is susceptible to enter into said guide (18), placed further away from said support body (12) with respect to said abutment portion (19).

3. Awning with arms according to claim 1 or 2, **characterized in that** the interception portion (21) of said locking body (20) in said interference position is in abutment on the stop portion (17) of said adjustment element (16) on the opposite side with respect to said abutment portion (19).

4. Awning with arms according to any one of the preceding claims, **characterized in that** the second rotation axis (Y) of the locking body (20) of said support device (11) is substantially orthogonal to said guide (18).

5. Awning with arms according to any one of the preceding claims, **characterized in that** the first end (10') of said articulated arm (10) is hinged to said tiltable body (13) with a fourth rotation axis (Z) substantially parallel to the second rotation axis (Y) of said locking body (20).

6. Awning with arms according to any one of the preceding claims, **characterized in that** the locking body (20) of said support device (11) comprises a locking pin (29) arranged parallel to said second rotation axis (Y) and rotatably inserted in a housing hole (30) obtained in said tiltable body (13) and transversely intersecting said guide (18).

7. Awning with arms according to claim 6, **characterized in that** said locking pin (29) is shaped with a transverse groove (33), which is partially delimited by said interception portion (21) and, with said lock-

ing body (20) in said non-interference position, such groove is positioned in the guide (18) of said tiltable body (13) in order to allow the passage of the stop portion (17) of said adjustment element (16).

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8. Awning with arms according to claim 6 or 7, **characterized in that** said control portion (22) is projectingly extended from said locking pin (29) substantially orthogonal to said second rotation axis (Y).

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9. Awning with arms according to any one of the preceding claims, **characterized in that** the control portion (22) of said locking body (20) is engaged in a sliding relationship on a shaped portion (35) of the first end (10') of said articulated arm (10).

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10. Awning with arms according to any one of the preceding claims, **characterized in that** said support device (11) comprises elastic means (36) acting on said locking body (20) in order to rotate it towards said non-interference position.

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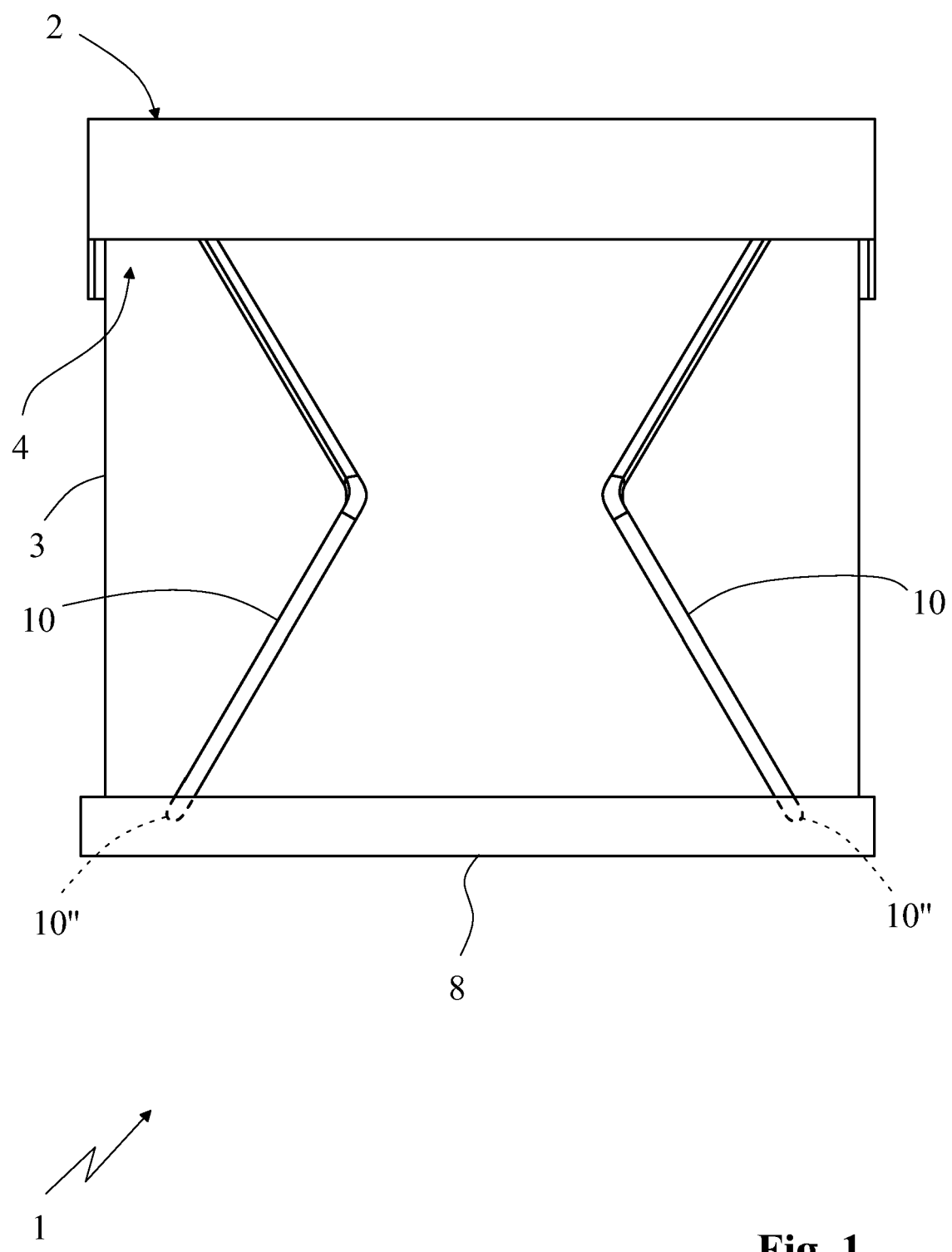


Fig. 1

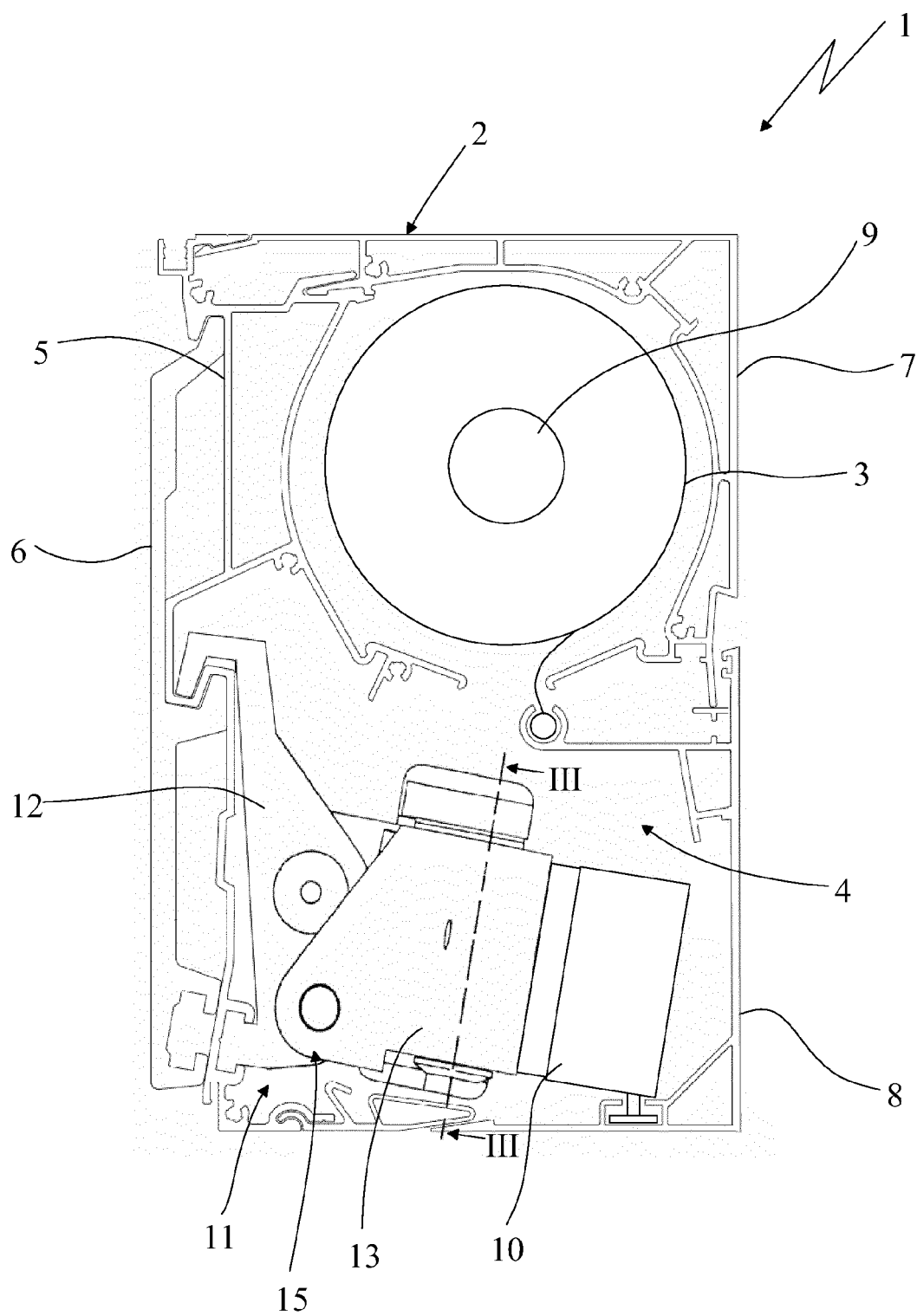


Fig. 2

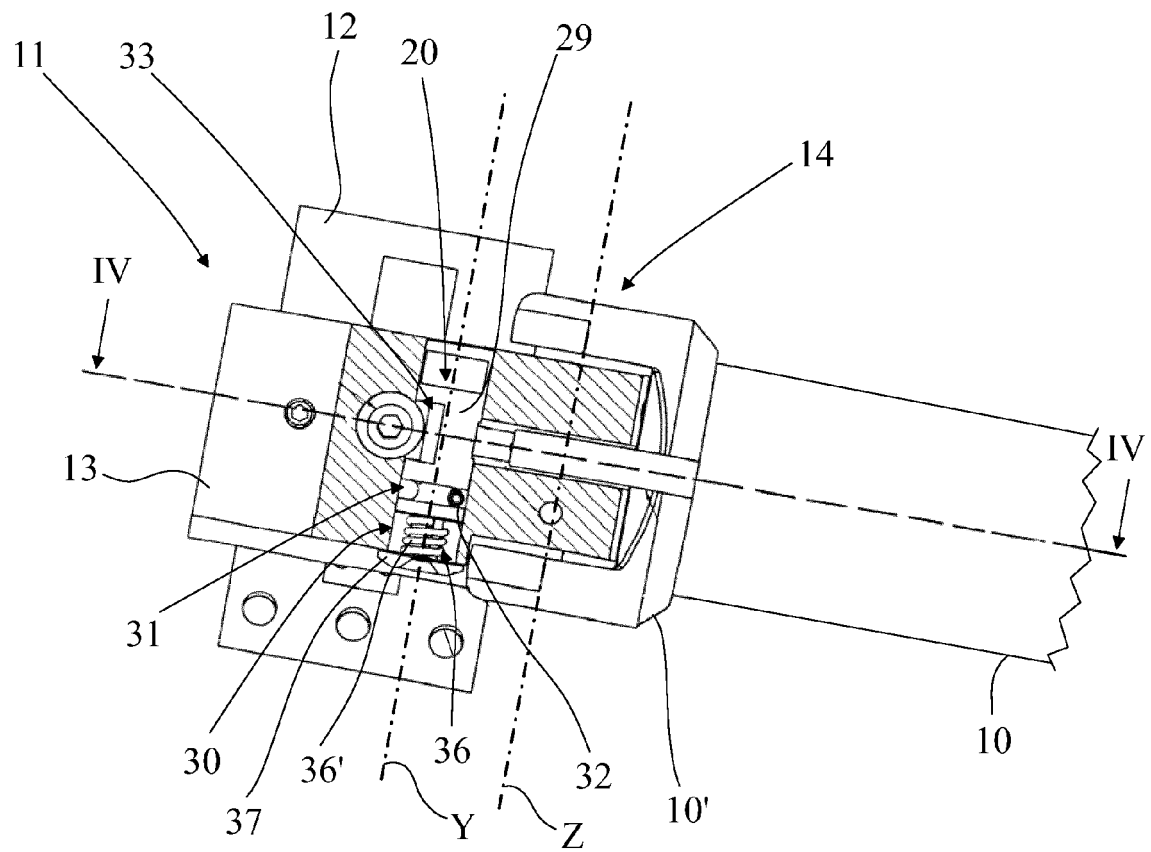


Fig. 3

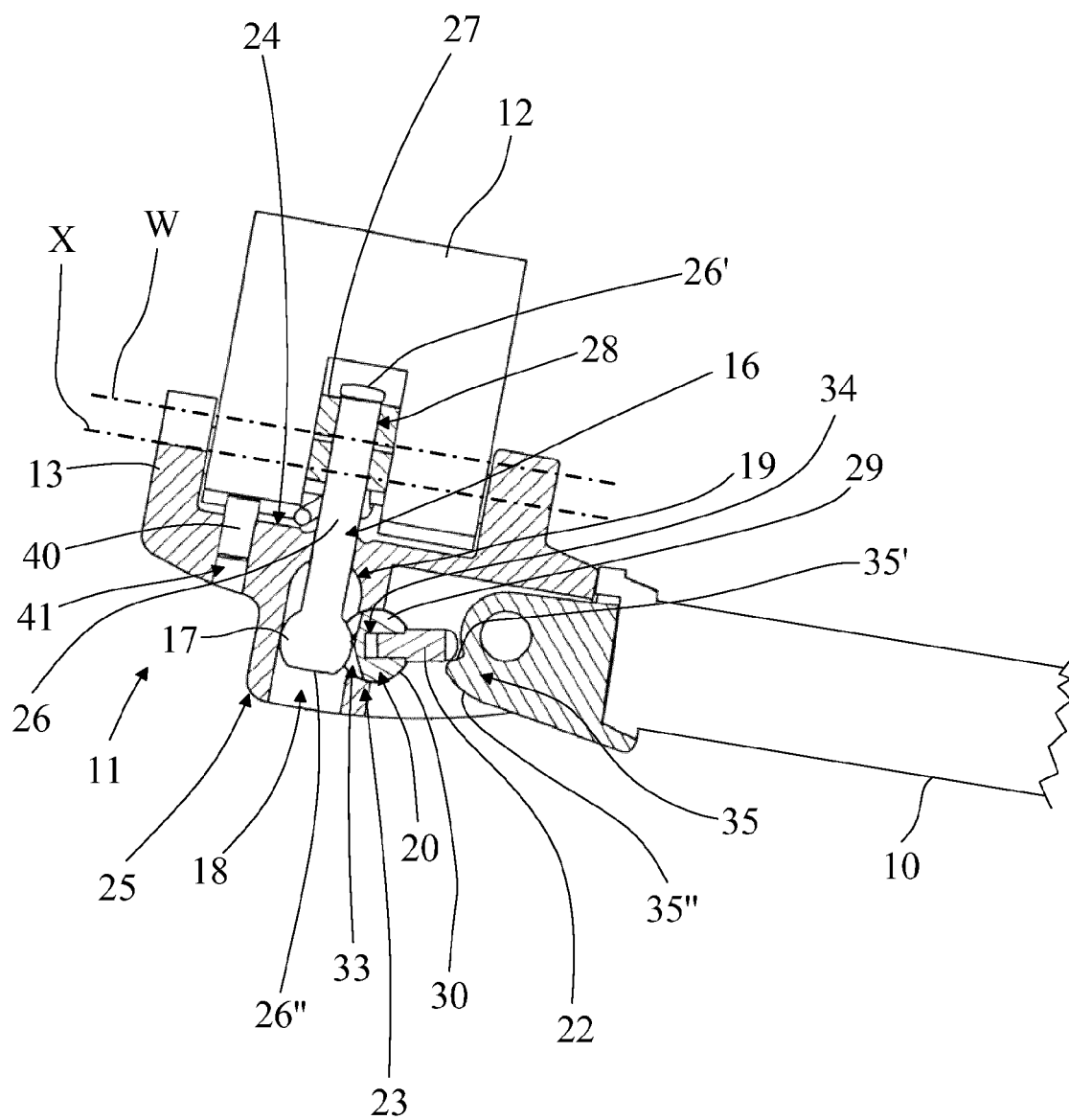


Fig. 4

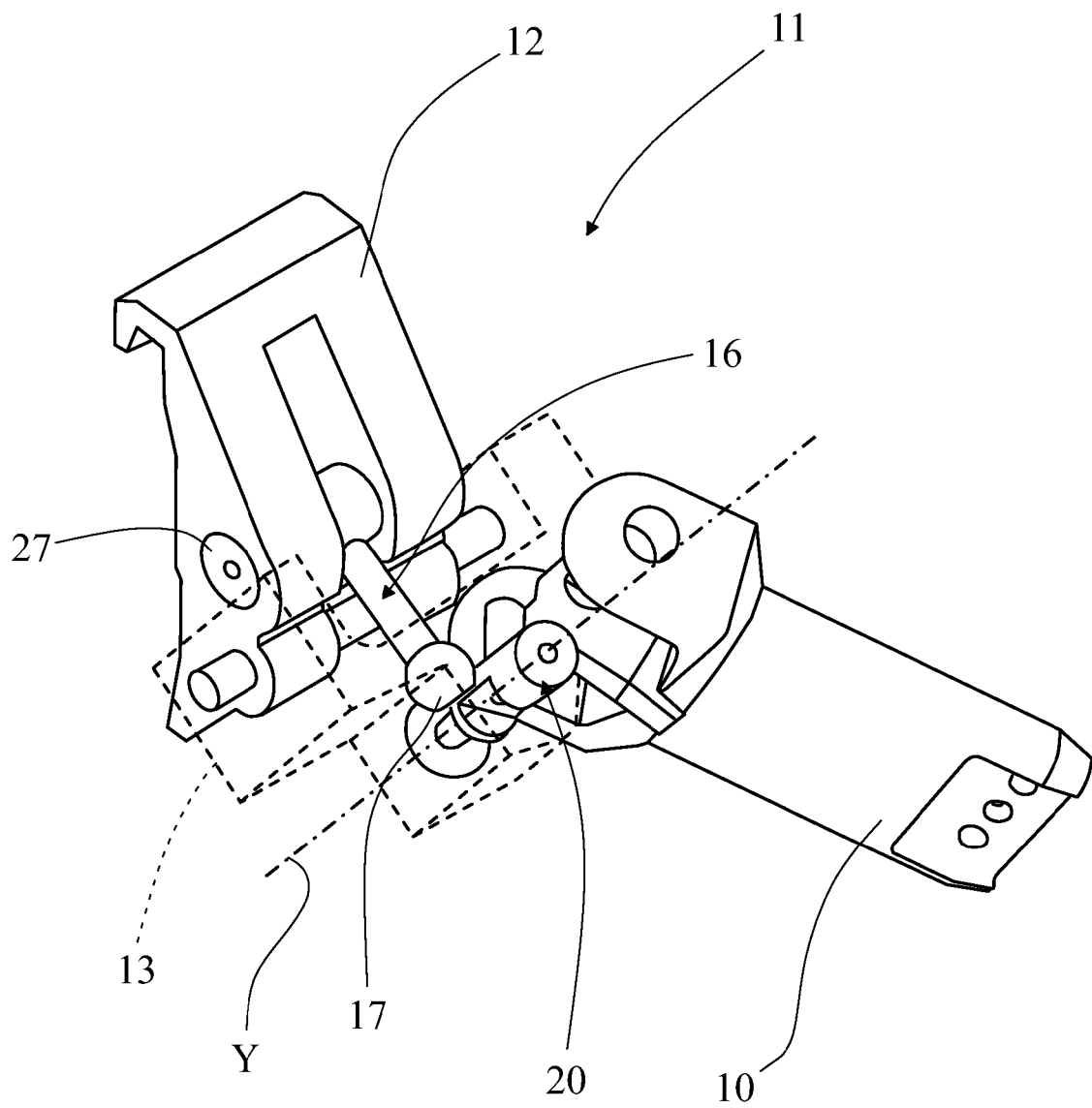


Fig. 5

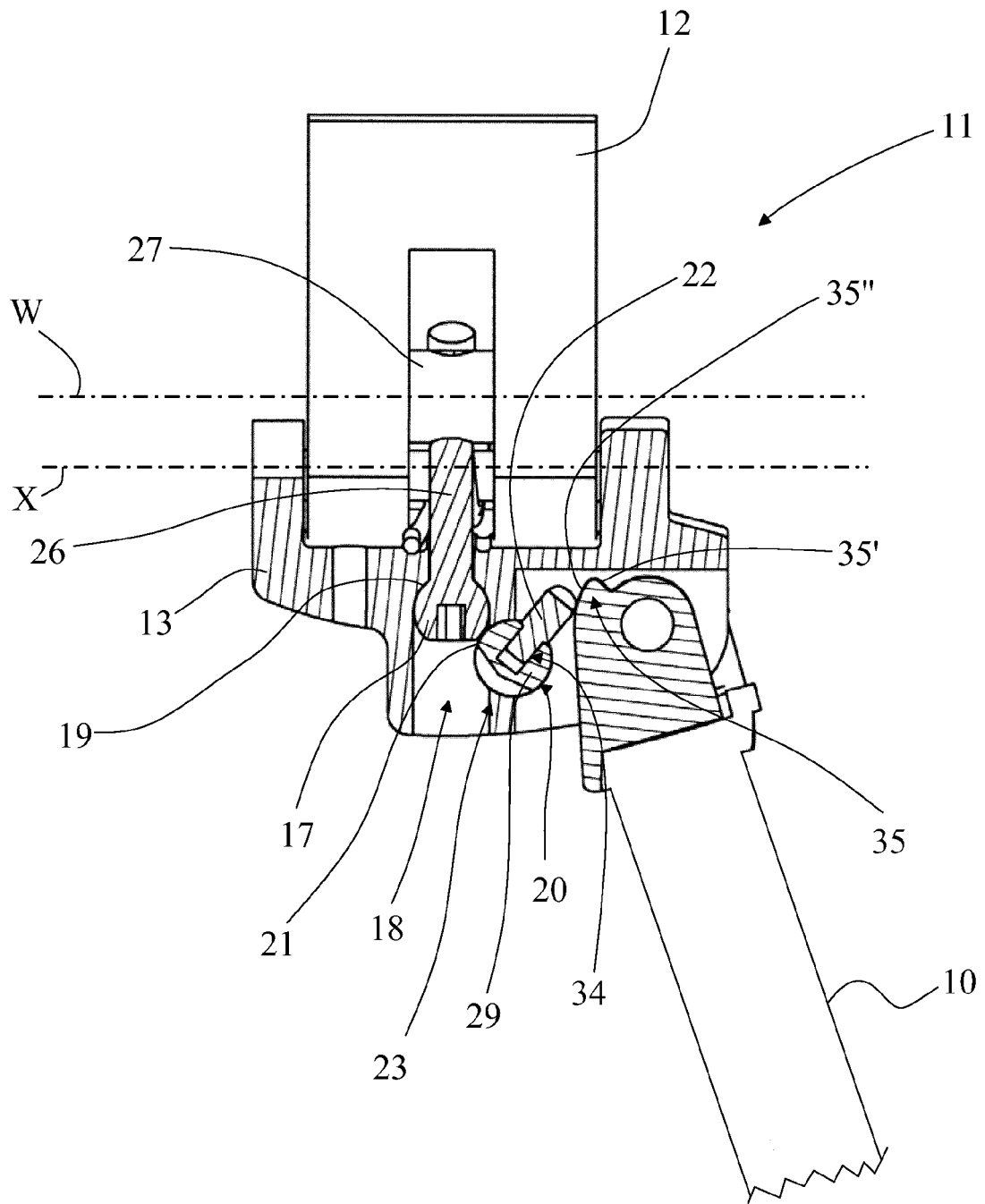


Fig. 6



EUROPEAN SEARCH REPORT

 Application Number
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A	DE 43 45 069 C1 (SCAFFIDI GIOVANNI [DE]) 27 April 1995 (1995-04-27) * column 3, lines 6-49; claims 1, 2; figures 1-3 *	1-10	
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			E04F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 25 April 2014	Examiner Weißbach, Mark
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