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

(11) EP 1 672 112 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
21.06.2006 Bulletin 2006/25

(51) Int Cl.:
D06F 55/02 *(2006.01)* *D06F 55/00* *(2006.01)*

(21) Application number: **05108619.7**

(22) Date of filing: **19.09.2005**

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

(30) Priority: **06.10.2004 IT TO20040679**

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(54) Support clip, in particular for hanging clothes

(57) A clip for suspending articles, in particular laundry items, comprises a first and a second gripping surfaces (8, 11b'), formed, respectively, in a first and a second jaw elements (6, 11), at least one of which is movable with respect to the other. The body (2) comprises a suspension portion (3, 4), for anchorage to a support (5), which is functionally independent with respect to the jaw elements (6, 11). The first jaw element (11) can be displaced manually to bring the first gripping surface (11b') progressively closer to the second gripping surface (8), up to a condition in which the article to be suspended (12) is gripped between the two gripping surfaces and the weight of the same article tends to cause a spontaneous movement of the first jaw element (11), in the sense of producing a further approach of the first gripping surface (11b') to the second gripping surface (8).

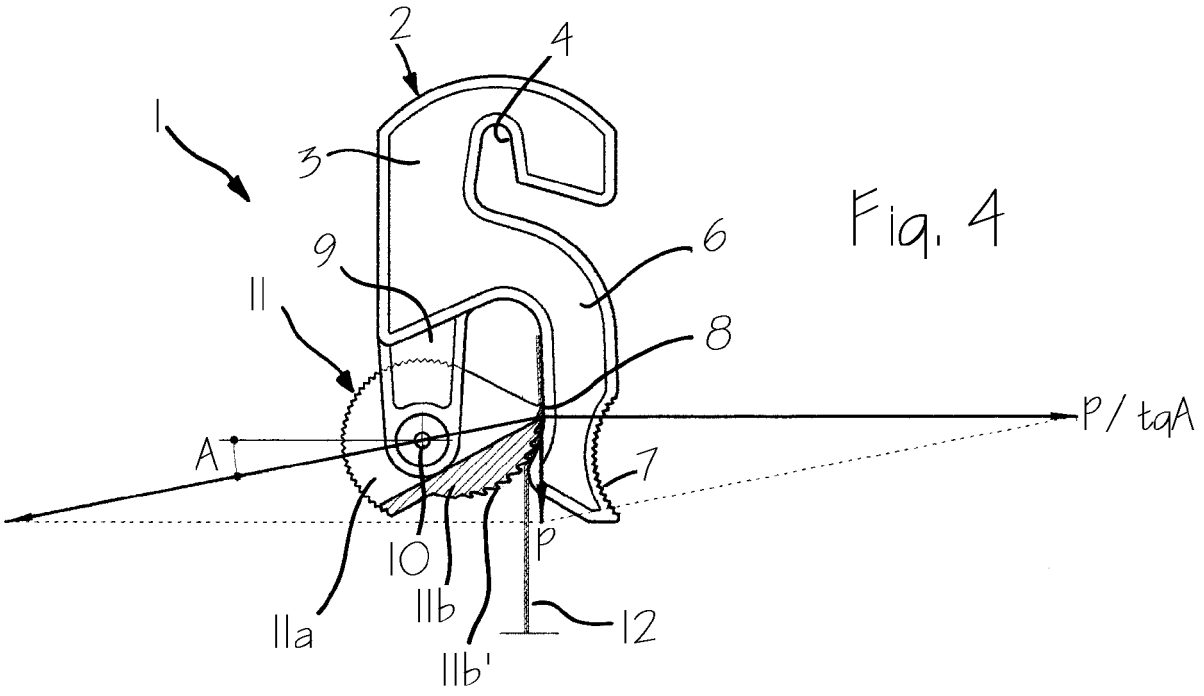

Fig. 4

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Description

TEXT OF THE DESCRIPTION

[0001] The present invention relates to a suspending clip, in particular for hanging laundry items.

[0002] Clips of the type referred to typically comprise two jaws mutally articulated, which can rotate with respect to one another about a central axis and in contrast to the elastic reaction of a spring. The clip is opened when a pressure is exerted at one end thereof so that, at the opposite end, the two jaws are divaricated. Following upon said divarication, the clip can bestride a support, for example a washing line, over which a flap of the item to be suspended has been previously folded or hung. The clip is then released so that, by virtue of the elastic reaction of the spring, the two jaws are re-closed against one other, simultaneously gripping together the supporting clothes line, wire or bar and the flap of the article to be suspended.

[0003] The clips according to the known type referred to present various drawbacks. A first drawback is represented by the rapid loss of the gripping force of the clip , due to oxidation of the metal spring, of whatever form this may be. Another drawback is represented by the fact that clips of a known type are suitable for suspending independently only articles of small weight, since they are devised to exploit the presence of the clothes line in order to increase the grip. As already mentioned, in fact, in order to ensure a secure grip, it is practically indispensable to fold a flap of the item to be suspended over the clothes line in such a way that the clip can grip both together simultaneously; however, this brings about the formation of undesirable creases in the laundry items and, very frequently, the depositing on the latter of traces of dirt left by the clothes line. The aforesaid loss of the elastic characteristic of the spring moreover renders the clips of a known type far from secure, above all in the event of a high wind.

[0004] Problems that are substantially similar to the previous ones are encountered also in the case of clips formed by a single body of plastic material, defining two jaws joined together by an intermediate portion that functions as elastic hinge.

[0005] In its general terms, the purpose of the present invention is to solve one or more of the aforesaid drawbacks. Said purpose is achieved, according to the invention, thanks to a clip for suspension of articles having the characteristics referred to specifically in the annexed claims, which form an integral part of the descriptive content of the present patent application.

[0006] The invention will now be described, purely by way of non-limiting example, with reference to the annexed plate of drawings, in which:

- Figure 1 is a schematic side view of a clip according to the invention, in an inoperative condition;
- Figure 2 is a schematic cross-sectional view of the clip of Figure 1;
- Figure 3 is a schematic view similar to that of Figure 2, with the clip in an operative condition;
- Figure 4 illustrates, with a view similar to that of Figure 3, a principle of operation of the clip according to the invention;
- Figures 5 and 6 are schematic cross-sectional views, similar to those of Figures 2 and 3, of a clip made according to a first variant of the invention;
- Figures 7 and 8 are schematic cross-sectional views, similar to those of Figures 2 and 3, of a clip made according to a second variant of the invention; and
- Figures 9, 10 and 11 are schematic views similar to those of Figures 1, 2 and 3, of a clip made according to a third variant of the invention.

[0007] Figures 1 to 3 are schematic representations of a first possible embodiment of a clip according to the invention, designated as a whole by 1. For the purposes of the ensuing description, it is assumed that said clip 1 is used for hanging a garment of clothing to be dried.

[0008] The clip 1 comprises a supporting body 2, for example made of a moulded thermoplastic material, which forms a fixed part of the clip 1. The body 2 comprises a substantially hook-shaped top portion 3, which delimits a seat 4 that is to engage with a support, designated by 5, constituted, for example, by a normal washing line, wire or bar for hanging clothes. As may be noted, the seat 4 is substantially V-shaped, or sharply angled, which enables use of the clip 1 in combination with lines, wires or bars 5 of different diameter. The aforesaid sharply angled shape likewise enables a considerable increase in the coefficient of friction between the line or bar 5 and the body 2 in a position corresponding to the seat 4.

[0009] Branching off from the intermediate portion of the body 2 at the bottom is a first arm, designated by 6, which forms a fixed jaw of the clip 1. In the case exemplified, the arm 6 has, on its outer side, a knurled recess 7 to facilitate the operation of closing and opening of the clip 1 with just two fmgers of one hand, as will emerge hereinafter. On the opposite side with respect to the recess 7, the arm 6 defines a respective gripping surface 8, which, in the case exemplified, comprises a terminal relief 8a. The surface 8 can be conveniently provided with an indented portion, with teeth oriented to favour the grip on the garment that is to be suspended by the clip 1.

[0010] Branching off, at the bottom, from the intermediate portion of the body 2 is a second arm 9, which in the embodiment illustrated is substantially parallel to the arm 6. Present in the terminal area of the arm 9 is a hole that is able to receive a small pin 10, via which hinged to the arm itself is an element 11 aimed at providing a mobile jaw of the clip 1. In the case exemplified, the element 11 is made of a single piece, for example, of thermoplastic material, having a fork-like portion comprising two parallel walls 11a, and a gripping portion, designated by 11b. The arm 9 of the body 2 is set between the walls 11a, provided with respective holes, in which the pin 10 is

inserted, with the gripping portion 11b that is substantially coplanar with respect to the arms 6 and 9.

[0011] In a possible variant embodiment, the pin 10 could be replaced by two coaxial and opposed appendages, each projecting from a respective wall 11a, or else by two appendages projecting from opposite sides of the arm 9. In a further variant the body 2 could comprise two arms 9 parallel to one another, between which there is eccentrically hinged a mobile element 11 configured as a substantially flat wheel.

[0012] Each wall 11a, at least in part having the shape of a circular sector, has an edge provided with respective knurling, designated by 11a', designed to facilitate rotation of the element 11 using one finger of a hand. On the other side, the gripping portion 11b at least in part has the shape of a toothed sector, having a respective front gripping surface, designated by 11b', which develops according to an arc of circumference and is provided with a respective indented portion, with teeth oriented to favour the grip on the article of clothing that is to be suspended from the clip 1.

[0013] As may be noted, the indented gripping surface 11b' develops in an eccentric way with respect to the axis of rotation constituted by the pin 10. In this way, with rotation of the element 11, the distance between its gripping surface 11b' and the gripping surface 8 of the fixed arm 6 can be varied between a maximum and a minimum, as may be seen in Figures 2 and 3, respectively.

[0014] For the purposes of use, the clip 1 is hooked onto the line 5 via the seat 4 formed in the top portion 3 of the body 2. At this point the clip 1 can be opened by bringing the element 11 into the position that may be seen in Figure 2. Said opening can be obtained by a user using just one hand, for example by resting the tip of the index finger in the recess 7 of the arm 6 and using the tip of the thumb to rotate the element 11 in the direction indicated by the arrow X. As may be noted, in the inoperative condition, or condition of opening, of the clip, the gripping surface 11b' of the element 11 is located at a first distance from the gripping surface 8 of the arm 6.

[0015] When the clip 1 is in the open position of Figure 2, in the interstice existing between the gripping surface 8 and the gripping surface 11b' there can be inserted a flap of the laundry item to be hung, designated by 12 in Figure 3.

[0016] The element 11 can subsequently be rotated in the reverse direction with respect to the previous one, as indicated by the arrow Y of Figure 3, to bring the clip 1 into an operative, or closing, condition, in which the distance between the gripping surface 11b' of the element 11 and the gripping surface 8 of the arm 6 is smaller than the aforesaid first distance.

[0017] Via the movement of the element 11, and given the eccentric disposition with respect to the pin 10 of its gripping surface 11b', the latter is progressively brought up closer to the gripping surface 8 of the fixed arm 6. As may be appreciated, at a certain point of the angular movement of the element 11, the flap of the garment 12 will be gripped between the two aforesaid gripping surfaces, in a position corresponding to a gripping point, which substantially depends upon the thickness of the fabric of the item 12. As has been said, the indented portion of the surface 11a' (and of the surface 8, if present) is oriented so as to grip on the laundry item 12 and then force the element 11 to rotate in the direction of gripping, if the item itself is pulled downwards.

[0018] Neglecting the friction on the pin 10 (which has a minimal diameter with respect to the dimensions of the element 11) and, as represented graphically in Figure 4, in order for there to arise a condition of active gripping by the clip 1, there must exist the condition $P(fl+f2)/tangA > P$, and hence $tangA < (fl+f2)$, where P is the weight of the item 20 to be suspended, f1 and f2 are the coefficients of friction on the two faces of the article 12, and A is the angle formed with respect to the horizontal by the plane passing through the pin 11 and the aforesaid gripping point.

[0019] Once this condition has initially been satisfied (for a normal item 12 made of cloth an angle A of approximately 20°-25° is sufficient) and if it is desired to increase the weight P progressively (for example, by pulling the laundry item 12 downwards), there will be obtained a reduction of the angle A, even due to a slight flexure of the arms 6 and 9, with a consequent increase in the component that determines the force of friction, and hence with further gripping of the clip 1.

[0020] Basically, then, the weight of the item 12 set hanging provides a component of force that tends to move the element 11 in the sense of bringing the gripping surface 11b' even closer to the gripping surface 8, 8a, thus keeping the garment gripped between these.

[0021] It should be pointed out that, in said condition, the V shape of the seat 4 favours, as a result of the weight of the garment 12, slotting of the line or bar 5 in the seat itself, and hence horizontal arrest of the clip 1 even in conditions of sustained wind.

[0022] In order to release the laundry item 12 from the clip 1, it is then sufficient to rotate the element 11 in the direction indicated by the arrow X of Figure 2.

[0023] Illustrated in Figures 5 and 6 is a second possible embodiment of the invention. In said figures, as in the subsequent ones, the same reference numbers are used as the ones used in Figures 1-4 for designating elements that are technically equivalent to the ones previously described.

[0024] In the embodiment of Figures 5 and 6, the body 2 of the clip 1 basically has two parallel arms 9, eccentrically hinged to each of which is a respective mobile element 11. In the case exemplified, the two elements 11 have an as a whole circular external profile and in effect form two rotatable jaws, provided with respective gripping surfaces 11b'. As may be appreciated from Figures 5 and 6, the dimensions and the relative positions between the mobile elements 11 are such that the respective gripping surfaces 11b' will be able to assume an operative condition and an inoperative condition,

where:

- in the operative condition, which may be seen in Figure 6, the surfaces 11b' are brought closer together, to withhold initially and then grip between them the laundry item, according to the same principles described previously;
- in the inoperative condition, which may be seen in Figure 5, the surfaces 11b' are set at a distance from one another, to enable insertion or release of the laundry item with respect to the clip 1.

[0025] In said embodiment, passage of the clip 1 from the operative condition to the inoperative condition, and vice versa, is obtained by rotating the elements 11 in the two directions indicated by the arrows X and Y.

[0026] In Figures 7 and 8, an embodiment of the invention is illustrated substantially similar to that of Figures 1-4. In this case, the body 2 of the clip 1 further integrates an elastic lamellar plate, designated by 13, which functions as end-of travel for the movement of opening of the element 11 and is operative for keeping the element itself in the respective inoperative condition. In the case exemplified, the elastic lamellar plate 13 branches off from the arm 6 of the clip 1.

[0027] The clip according to the invention can be made also using a linearly, instead of angularly, mobile component. Such a variant embodiment is illustrated in Figures 9-11.

[0028] In this case, the body 2 of the clip 1 has an arm 9 inclined with respect to the arm 6, on which an element 11 is slidably mounted.

[0029] In the case exemplified, the arm 9 has a central slit 14, in which an arrest or end-of-travel pin 15 forming part of the mobile element 11 is engaged. In this embodiment, the element 11 has a substantially parallelepipedal shape and is traversed, in height, by an inclined passage, designated by 16 in Figures 9 and 11. The inclination of the passage 16 substantially corresponds to the inclination of the arm 9. The element 11 comprises a respective gripping surface 11b', which in this case is substantially plane, as likewise plane is the gripping surface 8 of the fixed arm 6.

[0030] As may be appreciated from a comparison between Figures 10 and 11, the element 11 is mounted floating or slidable, with the inclined passage 16 and inclined arm 9 that form a cam system that enables approach and recession of the surface 11b' towards and away from the surface 8 according to the position of the element 11 along the arm 9.

[0031] The clip 1 can be opened by bringing the element 11 into the position that may be seen in Figure 10, sliding the element 11 upwards, along the arm 9, as indicated by the arrow X. As may be noted, in said condition, the gripping surface 11b' of the element 11 is moved away from the gripping surface 8 of the arm 6. When the clip 1 is in the open position of Figure 10, in the interstice existing between the gripping surfaces 8 and 11b' there can be inserted a flap of the laundry item. The element 11 can subsequently be slid downwards, as indicated by the arrow Y of Figure 11, to bring the clip 1 into the closing condition, in which the item is gripped between the gripping surface 11b' of the element 11 and the gripping surface 8 of the arm 6.

[0032] As may be seen, by virtue of the cam means constituted by the inclined arm 9 and by the passage 16, the movement of the element 11 downwards causes its gripping surface 11b' to be progressively brought closer to the gripping surface 8 of the fixed arm 6, until the garment is withheld and gripped, in a way similar to what has been described previously. It goes without saying that, for the purpose of releasing the garment from the clip 1 of Figures 9-11 it will be sufficient to raise the element 11 in the direction indicated by the arrow X of Figure 10.

[0033] From the foregoing description it may be appreciated how, irrespective of the embodiment chosen, the element 11 may be displaced manually to bring its gripping surface 11b' progressively closer to the other gripping surface 8 or 11b' up to a working condition in which the article to be suspended is gripped between the same surfaces. The weight of the article itself then tends to cause a spontaneous movement of the element 11, in the sense of producing a further approach of the gripping surface 11b' to the gripping surface 8.

[0034] In other words, then, the weight of the article to be suspended is exploited to obtain the necessary gripping force between the jaws of the clip, thus enabling elimination from the latter of the springs or other elastic elements typical of the known art. The working condition imposed on the clip always generates a clamping force, which is automatically adapted to the weight to be sustained, even when the latter were to be increased in an anomalous way by possible external forces, for example in the event of a high wind.

[0035] Thanks to the aforesaid characteristic, the clip 1 is able to sustain independently also articles of large weight, i.e., without the jaws having to grip simultaneously the support and a flap of the article to be suspended, as instead occurs with traditional clips. For said reason, the supporting portion 3, 4 of the clip 1 to the support 5 can be functionally separated from the area of gripping performed by the gripping surfaces 8, 11b'. In this way, the formation of undesirable creases in the garment suspended can be prevented, as well as the risks of deposit of dirt from the support itself on the garment.

[0036] Of course, without prejudice to the principle of the invention, the details of construction and the embodiments may vary widely with respect to what is described and illustrated herein, without thereby departing from the scope of the invention as defined by the ensuing claims.

[0037] The clip according to the invention may of course be used also for hanging or holding up articles different from laundry items and may assume any shape and size, as well as being made of plastic or metal material.

[0038] The supporting seat 4, especially for metal clips (hence ones suitable for sustaining larger loads), could also be shaped for fixing, to guides for slidable panels or for overhead conveyors, items that cannot otherwise be hooked or are far from easy to hook.

Claims

1. A clip for suspending articles, in particular articles of laundry, having a body (2) that can be anchored to a support (5) and comprising a first and a second gripping surfaces (8, 11b'; 11b'), formed, respectively, in a first and a second jaw elements (6, 11; 11), at least the first jaw element being movable with respect to the second jaw element, said clip being **characterized in that** said body (2) comprises a suspension portion (3, 4), for anchorage to said support (5), which is functionally independent with respect to the jaw elements (6, 11; 11) and **in that** at least the first jaw element (11) can be displaced manually to bring the first gripping surface (11b') progressively closer to the second gripping surface (8; 11b'), up to a condition in which the article to be suspended (12) is gripped between the two gripping surfaces (8, 11b'; 11b') and the weight of the same article (12) itself tends to cause a spontaneous movement of the first jaw element (11) in the sense of producing a further approach of the first gripping surface (11b') to the second gripping surface (8; 11b').

2. The clip according to Claim 1, **characterized in that** the first jaw element is configured as a member (11) that is angularly rotatable about a respective axis (10) and has a respective portion (11b) which defines the first gripping surface (11b'), the latter developing in an eccentric way with respect to said axis (10), in particular substantially according to an arc of circumference.

3. The clip according to Claim 1, **characterized in that** the first jaw element (11) is configured as a linearly slidable member, having a respective portion (11b) that defines the first gripping surface (11b').

4. The clip according to Claim 2, **characterized in that** the second jaw element is configured as a further member (11) that is angularly rotatable about a respective axis (10) and has a respective portion (11b), which defines the second gripping surface (11b'), the latter developing in an eccentric way with respect to said axis (10), in particular substantially according to an arc of circumference.

5. The clip according to Claim 1, **characterized in that** said body (2) comprises at least two fixed arms (6, 9), set alongside one another.

6. The clip according to Claims 2 and 5, **characterized in that** said angularly rotatable member (11) is pivoted to one (9) of said arms and **in that** the second gripping surface (8) is defined in the other (6) of said arms.

7. The clip according to Claims 3 and 5, **characterized in that** said linearly slidable member co-operates, via cam means (16), with one (9) of said arms and **in that** the second gripping surface (8) is defined in the other of said arms (6).

8. The clip according to Claims 4 and 5, **characterized in that** said angularly rotatable member (11) is pivoted to one (9) of said arms and **in that** said further angularly rotatable member (11) is pivoted to the other (9) of said arms.

9. The clip according to Claim 7, **characterized in that** the first and second gripping surfaces (8, 11b') are substantially parallel to one another and **in that** at least one of said arms (6, 9) is inclined with respect to the other.

10. The clip according to Claim 1, **characterized in that** the suspension portion (3, 4) comprises a seat (4) that is substantially V-shaped or sharply angled.

11. The clip according to Claim 1, **characterized in that** the suspension portion (3, 4) comprises a part (3) of said body (2) that is substantially hook-shaped.

12. The clip according to Claim 1, **characterized in that** at least one of said first and second jaw elements (6, 11; 11) has a surface knurling (7, 11a'), designed to facilitate manual displacement of the first jaw element (11) with respect to the second jaw element (6; 11).

13. The clip according to Claim 1, **characterized in that** at least one of the first gripping surface and the second gripping surface (8, 11b'; 11b') is provided with an indented portion, with teeth oriented to favour gripping on the article to be suspended (12).

14. The clip according to Claim 1, **characterized in that** it comprises means (13; 14, 15) to provide an end-of-travel element for the movement of the first jaw element (11).

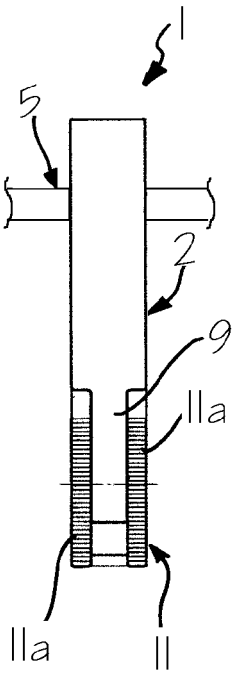


Fig. 1

Fig. 2

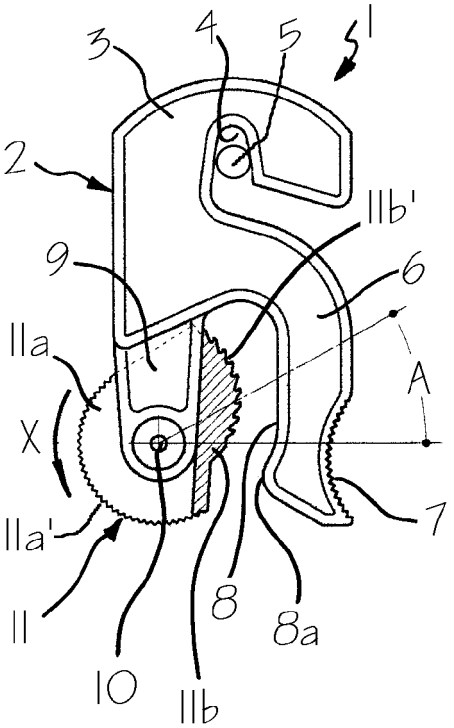
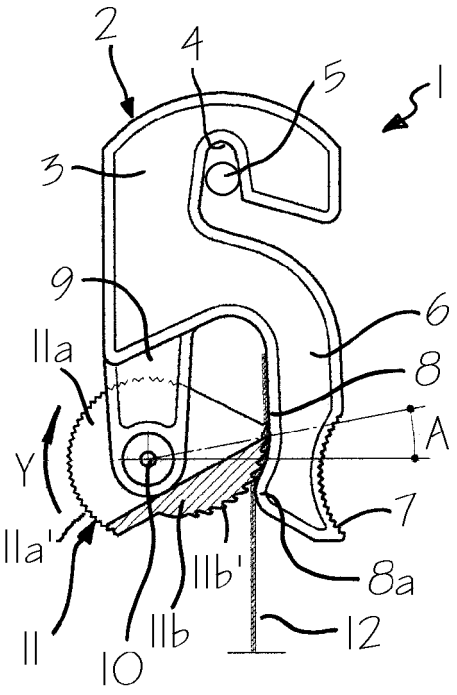


Fig. 3



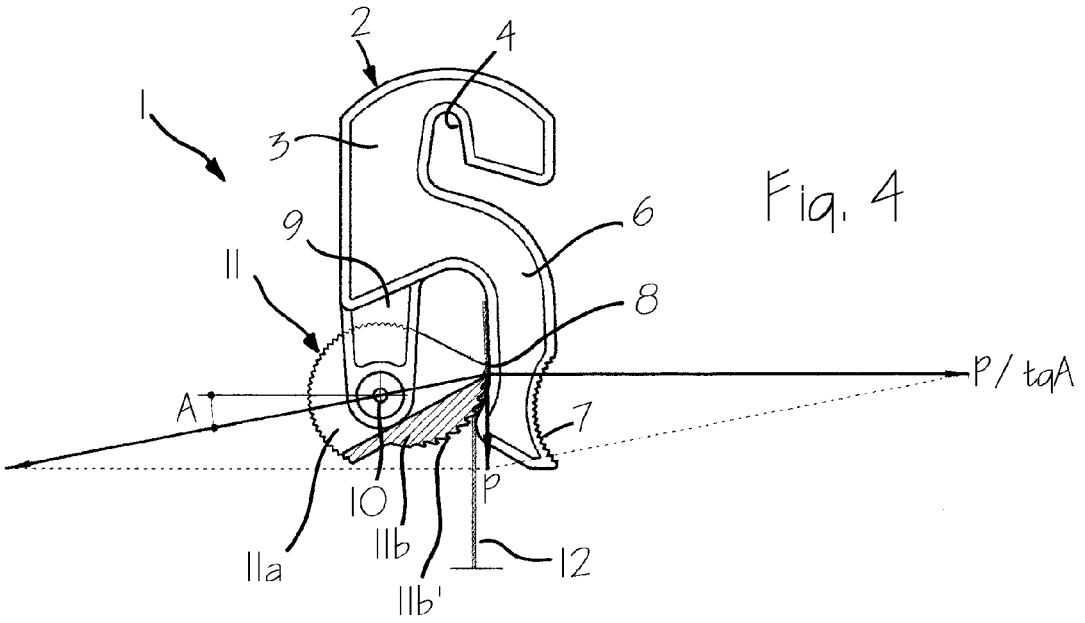


Fig. 4

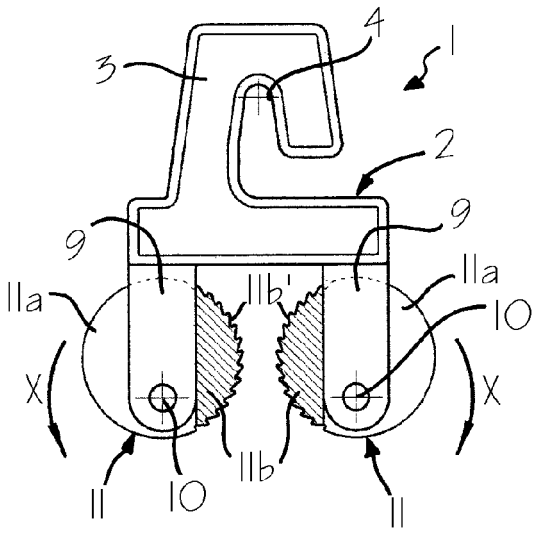


Fig. 5

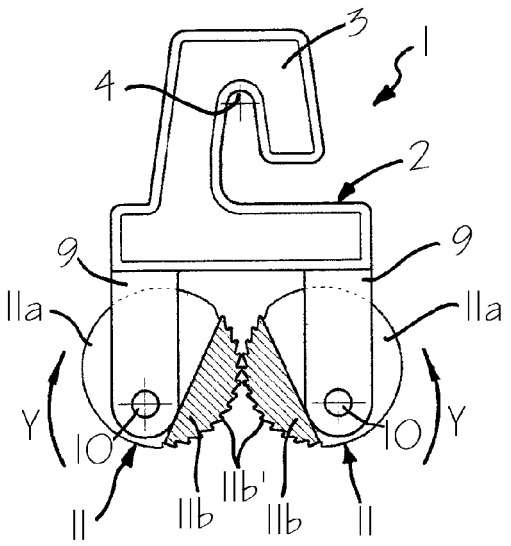


Fig. 6

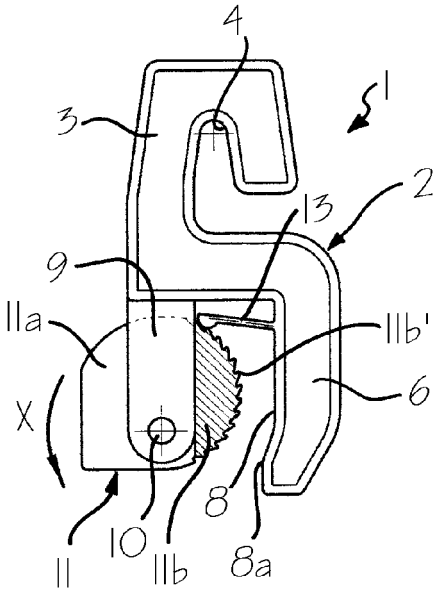


Fig. 7

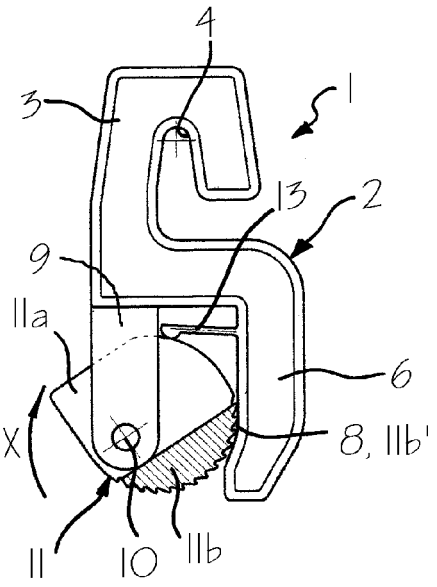


Fig. 8

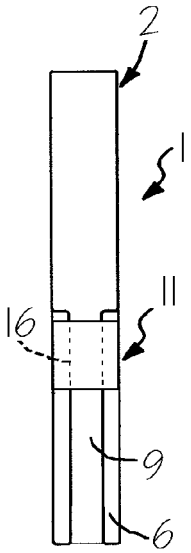


Fig. 9

Fig. 10

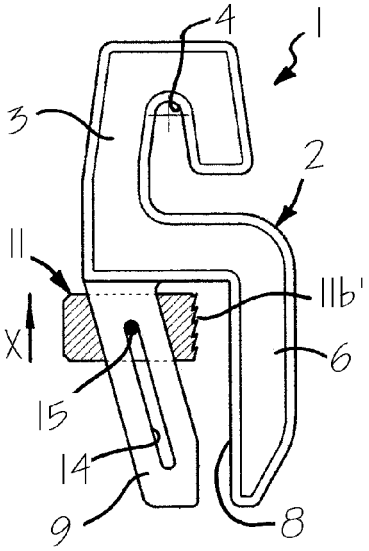


Fig. 11