

# PATENT SPECIFICATION

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## (54) WRITING IMPLEMENT OR ANALOGOUS OBJECT

(71) We, INTERLIGHT, a Swiss Body Corporate, of Moncur, Route des Biches, 1752—Villars-sur-Glane/Fribourg, Switzerland, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to a writing implement or an analogous object having a retractable clip for its fixing, for example, in a jacket pocket.

The term writing implement is understood to mean any manual writing instrument and more particularly a pen ball-point pen or propelling pencil having a retractable clip, either in a cap or in the body of the implement. Analogous objects within the meaning of the present invention can be any object having a clip for the fixing thereof, for example in a pocket or a piece of clothing or to a belt such as for example a miniaturised torch.

The known writing implements with a retractable clip can generally be subdivided into two categories.

The implements in one category have a retractable writing point and comprise a retractable clip located in the body of the implement whereby an operating mechanism is provided to extend the writing point and retract the clip and vice versa. In these writing implements the clip and conversely the writing point move between two locked positions, one being retracted and the other emergent. In writing implements of this type the clip is locked in its emergent position and then functions in the manner of a fixed clip, i.e. solely under its own elasticity which has various disadvantages. In particular the clip is not well suited for fixing the writing implement in pockets of different thicknesses and more particularly those with a limited thickness and the necessity of making an extremely elastic clip, considering decreases the resistance which it can be given and leads to the danger of damage being caused by applying too great a force.

The other category of writing implement with a retractable clip which has already been proposed comprises a retractable clip,

for example within the cap of the implement whereby the said clip is being continually returned to the retracted position by a flexible return member in such a way that the clip mainly grips on the pocket by the return action of this flexible member, making it possible for the clip to be adapted to pockets of different thicknesses.

However the proposals which have been made relative to such writing implements have not led to industrial production of implements of this type, particularly because the user is required to directly operate the clip to bring it into its emergent position whilst simultaneously fixing the writing implement in the pocket which calls for a clip with a difficultly obtainable complex movement.

In order to eliminate this disadvantage, it has already been proposed to provide the clip with an emergent extension either at the end of the writing implement or on the side opposite the clip to enable the user to act on this portion against an elastic return means.

However, these arrangements have not proved satisfactory in practice.

The placing of an emergent clip portion on the outside of the cap on the other side of the clip leads to an unaesthetic and uncomfortable external outline as compared with the complete implement body which is proposed to avoid by retracting the clip into the cap or the body when the implement is in use. The arrangement of an emergent clip portion at the upper end of the implement if it does not have this disadvantage requires a deformable clip of complex shape which makes the effective guidance of the clip difficult. In addition, the limited travel which is possible by this emergent portion makes it impossible to use an appropriate return means having a certain progressivity or constancy of the return force.

Attempts have already been made to eliminate these disadvantages by providing an axially movable plunger independent of the clip and provided with a ramp to laterally push back a curved clip end which enters the caps whereby a leaf spring acts on this end to draw the clip towards its retracted position. However, this solution leads to a

poor guidance of the clip and the danger of the curved portion of the clip jamming, particularly since due to various external causes the clips of writing instruments generally tend not to remain strictly parallel to the implement axis.

The present invention proposes to eliminate these disadvantages by providing a writing implement or analogous object having a retractable clip of the type wherein the clip is biased towards the retracted position to ensure an effective gripping action when the implement is carried in the pocket and wherein the clip is retracted when the writing implement is ready to write and has the object of providing the user with the possibility of a particularly smooth control of the clip movement with an extremely regular force, which can even be constant, whilst at the same time giving the clip a strength which protects it from wear and tear.

According to the present invention a writing implement or analogous object has a clip which is movable relative to a wall, for example the wall of a cap or an implement body between a retracted position in an orifice of the wall and an emergent position and exerting a gripping pressure under the action of biasing means biasing the clip towards its retracted position, an axially movable plunger independent of the clip controlling the movement of the clip by means of an inclined ramp co-operating with a clip head sliding transversely relative to the wall of the writing implement in which said head has a thickness in its direction of movement which is greater than the thickness of the clip and a surface of the head co-operating with and being guided by guidance means within the writing implement the said means extending substantially over the complete course of travel of the head.

Thus in advantageous manner, the clip head remains excellently guided over the whole of its course whereby the clip head preferably has a generally parallelepiped configuration with an inner surface cooperating with the transverse guidance surface extending substantially over the complete writing implement cross-section, and two parallel surfaces axially guided by two guidance surfaces perpendicular to the first guidance surface and also extending over the complete useful travel of the cap. The different guidance surfaces can advantageously be represented by a retaining member located in the body or the cap of the writing implement.

The action of the return member on the sliding head of the clip is preferably effected in a direction which is substantially parallel to the sliding direction of the clip head.

The sliding plunger is preferably mounted at the end of the body of the writing implement or cap wherein the clip is mounted and in a particularly advantageous embodiment

the said plunger cooperates with the said head via an inclined ramp both relative to the plunger displacement direction and relative to the sliding direction of the clip head. This ramp can advantageously cooperate with the roller, the ramp being for example being integral with the plunger and the roller integral with the clip head. Advantageously, the shape of the ramp can be curved in such a way as to ensure a constant reaction force of the clip under the action of the elastic return member. The latter can advantageously comprise a catch spring whereof one of the branches acts on the clip head whilst the other is jammed against an appropriate surface of the cap or, implement body. This catch spring advantageously has central turns in order to permit a more regular stress. In a particular advantageous embodiment, the roller spindle of the clip head projects on either side of the clip head and the return member comprises new parallel springs respectively acting on the two projecting ends of the roller spindle.

Preferably the retaining member is introduced from the orifice of the upper end of the cap or implement body and is maintained inside by a lower member which is supported against an abutment which is integral with the body of the writing implement or cap comprising for example, a portion which is left intact in the retraction slot of the clip, this said lower member being fixed to the maintaining member by means of a screw. In the case where this lower member is carried by the cap, it can advantageously be in the form of a grip receiving the writing point of the writing implement and provided preferably with lugs which cooperate with a groove of the implement point so as to ensure that the cap is maintained axially on the writing implement body.

According to a special embodiment, an upper member is provided to guide the plunger/ramp assembly whereby this member has an inner recess for the passage of the ramp and the clip head with two lateral tabs receiving the ends of a support spindle of the spring or springs; itself fixed to the maintaining member, whereby the upper member is thus made integral with the maintaining member.

This member can advantageously have or support along the writing implement wall, opposite to the clip head, a slide plate for example, of hardened steel against which can slide the plunger/ramp assembly in order to protect the wall against the considerable forces which can be exerted thereon by the said assembly.

Other advantages and characteristics of the invention will be gathered from reading the following description made relative to a non-limitative example and with reference to the attached drawings wherein:

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Fig. 1 represents a perspective view of a writing implement according to the invention.

Fig. 2 represents a view in longitudinal section of the writing implement cap taken in a direction passing substantially through the roller spindle.

Fig. 3 shows a view in longitudinal section of the cap in a plane perpendicular to the roller spindle and passing through the roller.

Fig. 4 shows a view in accordance with Fig. 3 with the cap in the external position.

Fig. 5 shows a sectional view in the direction V—V of Fig. 2.

Fig. 6 shows a view of the joint between the cap and the writing implement body in the same plane, as Fig. 3.

Fig. 7 shows a view of the joint in the same plane as Fig. 3.

Fig. 8 shows a view analogous to Fig. 5 but in a variant of the invention.

Fig. 9 shows a view analogous to Fig. 1 in this variant, however the clip head is not shown.

The writing implement shown in Fig. 1 has a body 1 upon which there is a cap 2 with a retractable clip 3. The implement body 1 in the same way as the cap 2 substantially comprises a hollow cylinder with a substantially oval cross-section.

The clip 3 can be retracted into the cap 2 passing through a slot 4 which has an interruption at 5 consisting of an uncut portion of the cylindrical wall 2 moved back by a certain distance within the slot.

Within the cap is arranged a retaining member 6 having a less thick central portion 6a extended by two vertical tabs 6b, which leave between them a horizontal guidance surface 6c. As can be seen in Fig. 4 each tab 6b comprises a horizontal elongated notch whereof the upper portion is delimited by a portion 6d shortened in the horizontal direction relative to the remainder of the tab 6b. The retaining member 6 is fixed to the cap body by means of the grip 7 for receiving the writing head 8 of writing implement body 1. This grip 7 advantageously has two elastic tabs 7a terminated by lugs 7b which enter a corresponding groove 8a of the writing head in such a way as to maintain the latter axially locked when the cap is joined to body 1. During its fixing, the lower member or grip 7 introduced via the lower portion of cap 2 strikes against portion 5 which prevents it from continuing its upward movement. A screw 9 joins together members 6 and 7 with the insertion of a deformable compensation joint 10.

In the upper portion of tab 2 is provided an upper member 11 having a central recess 11a, and two lateral tabs 11b whereby it can be seen in Fig. 5 that they have a vertical slot 11c whose edges are elastically deform-

able and have a notch which permits each slot 11c to receive one end of a horizontal shaft 12 whose central portion traverses a corresponding orifice of portion 6a of retaining member 6. In this way, member 11 is made axially integral with member 6 and all the members 6, 7 and 11 are prevented from any lateral displacement by their external shapes cooperating with the cylindrical internal shape of the cap.

The upper portion of member 11 receives a sliding plunger 13 having a cylindrical shape extending the cylindrical shape of cap 2 to slide supported on the periphery of member 11. An ornamental ring 14 integral with the cap makes it impossible to see the joint between the cylindrical surface of the plunger 13 and the remainder of the cap 2. Plunger 13, which is moved away from member 11 by a return spring 15 is made integral with a cam 17 guided in the orifice 11a of member 11 by a screw 16. This cam 17 has on its lower portion a curved ramp 18. Consequently on pressing on plunger 13, the said plunger is vertically slid downwards and therefore the ramp 18 descends in a vertical translation movement and the ramp/plunger assembly is moved elastically upwards by spring 15, when thrust is discontinued.

The clip 3, has a head 3a, which is relatively thick in the vertical direction whereby the head is solid in its portion closest to the body of clip 3 (as can be seen on Fig. 3) and having two vertical tabs 3b in such a way that in the retracted position of the clip shown in Fig. 3 head 3a extends from the right, i.e. from clip 3 to close to the left-hand portion of cap 2. A spindle 19 is maintained integral with the two tabs 3b passing through corresponding orifices of the said tab to emerge at the outside via its ends as shown in Fig. 2. In its central portion, i.e. within the space left free within two tabs 3b is provided a rotary roller 20 cooperating with ramp 18 carried by cam 17 whose thickness in the portion carrying the ramp 18 is sufficiently small to be able to enter the space separating tab 3b.

Two catch springs 21 are coiled onto the two portions of shaft 12 arranged between member 6 and tabs 11c and are supported by their shorter arm against an edge 6c of member 6 and by their longer arm against the projecting ends of spindle 19. The said ends are provided with two grooves which facilitate the contact of the springs with the said ends.

Starting from the retracted clip position shown in Figs. 2 and 3, when the user presses vertically on cap 13 he causes ramp 18 to slide vertically against spring 15. In this sliding movement ramp 18 acts on roller 20 and pushes head 3a of the clip towards the outside which is guided laterally between the inner surfaces of tabs 6b of the retaining

member 6 and, in its lower portion by surface 6c whereon is supported head 3a and the lower portion of tabs 3b of the said head. In its upper portion, head 3a is guided by base 4a of slot 4 and stop 3c being provided level with each tab 3b to prevent, by stop 3c striking against the end 4a of the slot, the head 3a from passing outside the cap. During the downward movement of plunger 13, the lateral sliding towards the outside of head 3a leads to the separation of clip 3 from the cap as well as the compression of springs 21. By appropriately choosing the inwardly curved shape on ramp 18, it is possible in spite of the increasing tension of spring 21, when plunger 13 is lowered to maintain constant the necessary pressure to overcome the said springs in such a way that the operation of plunger 13 requires a completely regular and constant force to be applied by the user.

At the end of thrust, clip 3 is completely emergent in the position shown in Fig. 4. In this position the user can hook on the cap carrying the writing implement body 1. He can if necessary, also use the elasticity of clip 3 relative to head 3a. If the user tends to separate the clip from the cap via a force applied to the lower portion of the clip, the head 3a tends to turn outwardly about its upper end but due to the very large support surface of the head with surface 6c, no damage can occur to the respective guidance surfaces of head 3 and retaining member 6.

When the user relaxes the pressure on plunger 13, springs 21 supported on the two ends of spindle 19 return the head 3 by transverse sliding into the cap whilst plunger 13 is moved upwards with ramp 18 under the action of spring 15.

If no obstacle is placed between clip 3 and cap 2 the springs 21 bring the head into the initial position shown in Fig. 3. If, however, an obstacle such as the thickness of a material is present, this obstacle is gripped between the clip 3 and cap 2 under the action of springs 21 in such a way that attachment is ensured even in the case of an extremely thin material.

In order to mount the device in cap 2, firstly plunger 13 and cam 17 are assembled by means of screw 16 on either side of guidance member 11. Then member 11 is joined to member 6 by elastically causing tabs 11b to cover the ends of shaft 12 which have previously received the two springs 21. The thus obtained assembly is then introduced via the upper portion of the cap until a light peripheral shoulder of member 11 strikes against the upper end of the cylindrical wall of cap 11 as shown in Fig. 2. Then a hook-shaped member is introduced into the upper portion of slot 4, whereby the hooks engage with springs 21, in order to press down the said springs permitting thereby the introduction of head 3a of the cap through slot 4,

at the end of which the springs are freed and are then supported on the ends of spindle 19 as shown in the drawing.

Member 7 is then introduced through the bottom of the cap and members 6 and 7 are assembled by means of screw 9 whereby joint 10 is inserted between them.

A variant of the invention is shown in Figs. 8 and 9, wherein the clip is not shown for reasons of clarity.

In this variant the upper member 11<sup>1</sup> has its vertical slot 11<sup>1</sup>c in the centre of each of the lateral tabs 11<sup>1</sup>b, whereby the elastically deformable edges of this slot have a notch permitting the reception of one end of a horizontal shaft 12<sup>1</sup> whose cross-section is, on this occasion, square. The central portion of shaft 12<sup>1</sup> traverses a corresponding orifice of member 6<sup>1</sup>a of retaining member 6<sup>1</sup>. It can also be seen that member 11<sup>1</sup> has a collar 11<sup>1</sup>d which strikes against the upper end of writing implement body 1. Otherwise, member 11<sup>1</sup> is substantially identical to member 11.

With reference more particularly to Fig. 9, a section analogous to the section V—V is shown wherein the left-hand tab 11<sup>1</sup>b is omitted providing a lateral view of the retaining member 6<sup>1</sup> as well as of the plunger/ramp assembly. Preferably the plunger 13 is made as a single member in the form of a cylindrical recipient fixed to an underlying portion 13<sup>1</sup>a having elastic clip properties, enabling cylindrical member 13 to be fitted by clipping.

As can be seen on Fig. 9, wall portion 2 along which ramp 18 slides is internally covered with a steel plate 22 maintained in place by member 11<sup>1</sup> by not shown means. It has been found that in this position where the maximum reaction force is exerted so that the steel plate 22 on which the ramp slides prevents wall 2 being subject to two loads.

The retaining member 6<sup>1</sup> has an upper portion comprising two lateral tabs 6<sup>1</sup>b, between which is arranged a base 6<sup>1</sup>c which is also preferably reinforced by a steel plate (not shown). Fig. 9 shows that each tab 6<sup>1</sup>b has on the clip outlet side a higher portion and the slot of the tab has been omitted and replaced by a height decrease of most of the tab.

On each of its two lateral surfaces, whereof one is shown in Fig. 9, member 6<sup>1</sup> has a reinforcement 6<sup>1</sup>f wherein are located the turns of a catch spring 21<sup>1</sup> whereof the longest branch 21<sup>1</sup>a extends along the lateral surface of member 6<sup>1</sup> to beyond the upper portion of the tab 6<sup>1</sup>b in such a way as to push the end of spindle 19 (schematically shown in Fig. 9). Branch 21<sup>1</sup>b is immobilised in a corresponding portion of reinforcement 6<sup>1</sup>f. Preferably the lateral surface of member 6<sup>1</sup> has a second reinforce-

ment smaller than reinforcement 6<sup>f</sup>, whereby branch 21<sup>a</sup> moves in this second reinforcement so that spring 21<sup>1</sup> does not project beyond member 6<sup>f</sup>.

#### WHAT WE CLAIM IS:—

1. A writing implement or analogous object having a clip which is movable relative to a wall between a retraction position in an orifice of the wall and an emergent position and exerting a gripping pressure under the action of biasing means biasing the clip towards its retracted position, an axially movable plunger independent of the clip controlling the movement of the clip by means of an inclined ramp cooperating with a clip head sliding transversely relative to the wall of the writing implement in which the said head has thickness in its direction of movement which is greater than the thickness of the clip and a surface of the head co-operating with and being guided by guidance means within the writing implement the guidance means extending substantially over the complete course of travel of the head.
2. A writing implement or analogous object according to Claim 1, in which the said clip head is guided in its lower portion by a transverse surface arranged with the wall and in its upper portion, by the base of the orifice of the wall, whereby the said head has a stop limiting its movement outside the wall.
3. A writing implement or analogous object according to either of the Claims 1 and 2, in which the said head has a roller which rotates on a spindle to cooperate with the said ramp.
4. A writing implement or analogous object according to any one of the Claims 1 to 3, in which the said head has a substantially parallelepiped shape and is guided on its two lateral surfaces by two corresponding surfaces within the writing implement.
5. A writing implement or analogous object according to any one of Claims 1 to 4, in which the said ramp has a curved shaped so that a constant force exerted on the plunger is sufficient to move the head into the emergent position.
6. A writing implement or analogous object according to any of Claims 1 to 5, in which the said plunger is brought into the inoperative position by a return spring.
7. A writing implement or analogous object to any one of Claims 1 to 6, which the said clip head has two parallel tabs supporting the spindle of the rollers whereby the said roller is placed between the said tabs and the thickness of the ramp being less than the said slots separating the said two tabs.
8. A writing implement or analogous object according to any one of Claims 1 to 7, in which the roller spindle of the clip head

projects beyond the clip head on either side whereby the said projecting ends cooperate with two return springs of the clip head.

9. A writing implement or analogous object according to any one of Claims 1 to 8, in which the said return means comprises at least one catch spring.

10. A writing implement or analogous object according to any of Claims 1 to 9, in which it has a hollow cylindrical wall which contains a retaining member having a guidance surface for the lower portion of the clip head whereby the said retaining member is integral with guidance means of the plunger/ramp assembly and has in addition, attachment and support means for the return member.

11. A writing implement or analogous object according to Claim 10, in which the guide means of the plunger/ramp assembly comprise an upper member having two tabs, each provided with elastically deformable slots with a notch receiving one of the projecting ends of a spindle integral with the said retaining member and ensuring the fixing of the elastic return member or members.

12. A writing implement or analogous object according to any one of Claims 1 to 11, in which it has a reinforcement plate arranged substantially opposite to the head against which the plunger/ramp assembly slides.

13. A writing implement or analogous object according to either of Claims 10 or 11, in which the said retaining member has in its upper portion, two parallel tabs between which can slide the clip head whereby the inner surfaces of the said tabs serve for the lateral guidance of the said head.

14. A writing implement or analogous object according to any one of Claims 10 to 14, in which the said retaining member is fixed by a lower member supported against an abutment of the wall and is rendered integral with the retaining member by assembly means.

15. A writing implement or analogous object according to Claim 14, in which the said abutment means comprises an uncut portion of the retracting orifice of the clip, the said portion being displaced towards the inside of the implement wall.

16. A writing implement according to any one of the Claims 10 to 15, in which the clip is carried by a cap in which the said lower member comprises an elastic grip comprising elastic attachment means of the writing point of the writing implement.

17. A writing implement or analogous object according to Claim 11, in conjunction with any of the Claims 12 to 16 in which the plunger has a lateral wall sliding on the periphery of the said upper member and arranged in the extension of the wall.

18. A writing implement or analogous

ment smaller than reinforcement 6<sup>f</sup>, whereby branch 21<sup>a</sup> moves in this second reinforcement so that spring 21<sup>1</sup> does not project beyond member 6<sup>1</sup>.

# WHAT WE CLAIM IS:—

1. A writing implement or analogous object having a clip which is movable relative to a wall between a retraction position in an orifice of the wall and an emergent position and exerting a gripping pressure under the action of biasing means biasing the clip towards its retracted position, an axially movable plunger independent of the clip controlling the movement of the clip by means of an inclined ramp cooperating with a clip head sliding transversely relative to the wall of the writing implement in which the said head has thickness in its direction of movement which is greater than the thickness of the clip and a surface of the head co-operating with and being guided by guidance means within the writing implement the guidance means extending substantially over the complete course of travel of the head.
2. A writing implement or analogous object according to Claim 1, in which the said clip head is guided in its lower portion by a transverse surface arranged with the wall and in its upper portion, by the base of the orifice of the wall, whereby the said head has a stop limiting its movement outside the wall.
3. A writing implement or analogous object according to either of the Claims 1 and 2, in which the said head has a roller which rotates on a spindle to cooperate with the said ramp.
4. A writing implement or analogous object according to any one of the Claims 1 to 3, in which the said head has a substantially parallelepiped shape and is guided on its two lateral surfaces by two corresponding surfaces within the writing implement.
5. A writing implement or analogous object according to any one of Claims 1 to 4, in which the said ramp has a curved shaped so that a constant force exerted on the plunger is sufficient to move the head into the emergent position.
6. A writing implement or analogous object according to any of Claims 1 to 5, in which the said plunger is brought into the inoperative position by a return spring.
7. A writing implement or analogous object to any one of Claims 1 to 6, in which the said clip head has two parallel tabs supporting the spindle of the rollers whereby the said roller is placed between the said tabs and the thickness of the ramp being less than the said slots separating the said two tabs.
8. A writing implement or analogous object according to any one of Claims 1 to 7, in which the roller spindle of the clip head

projects beyond the clip head on either side whereby the said projecting ends cooperate with two return springs of the clip head.

9. A writing implement or analogous object according to any one of Claims 1 to 8, in which the said return means comprises at least one catch spring.

10. A writing implement or analogous object according to any of Claims 1 to 9, in which it has a hollow cylindrical wall which contains a retaining member having a guidance surface for the lower portion of the clip head whereby the said retaining member is integral with guidance means of the plunger/ramp assembly and has in addition, attachment and support means for the return member.

11. A writing implement or analogous object according to Claim 10, in which the guide means of the plunger/ramp assembly comprise an upper member having two tabs, each provided with elastically deformable slots with a notch receiving one of the projecting ends of a spindle integral with the said retaining member and ensuring the fixing of the elastic return member or members.

12. A writing implement or analogous object according to any one of Claims 1 to 11, in which it has a reinforcement plate arranged substantially opposite to the head against which the plunger/ramp assembly slides.

13. A writing implement or analogous object according to either of Claims 10 or 11, in which the said retaining member has in its upper portion, two parallel tabs between which can slide the clip head whereby the inner surfaces of the said tabs serve for the lateral guidance of the said head.

14. A writing implement or analogous object according to any one of Claims 10 to 14, in which the said retaining member is fixed by a lower member supported against an abutment of the wall and is rendered integral with the retaining member by assembly means.

15. A writing implement or analogous object according to Claim 14, in which the said abutment means comprises an uncut portion of the retracting orifice of the clip, the said portion being displaced towards the inside of the implement wall.

16. A writing implement according to any one of the Claims 10 to 15, in which the clip is carried by a cap in which the said lower member comprises an elastic grip comprising elastic attachment means of the writing point of the writing implement.

17. A writing implement or analogous object according to Claim 11, in conjunction with any of the Claims 12 to 16 in which the plunger has a lateral wall sliding on the periphery of the said upper member and arranged in the extension of the wall.

18. A writing implement or analogous



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object according to Claim 17, in which it has an ornamental ring fixed to the wall and masking the gap between the wall and the lateral wall of the plunger.

5 19. A writing implement according to any one of Claims 1 to 14, 17 and 18, in which the clip is carried by a cap.

20. A writing implement or analogous

object substantially as described hereinbefore with reference to the drawings.

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