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(71) Applicant and
(72) Inventor: **MEDHURST, Simon** [CA/CA]; 3218 Rainbow Court, Burlington, Ontario L7M 2T8 (CA).

(74) Agent: **HOFBAUER, Patrick, J.**; Lang Michener LLP, P.O. Box 747, Suite 2500, Brookfield Place, 181 Bay Street, Toronto, Ontario M5J 2T7 (CA).

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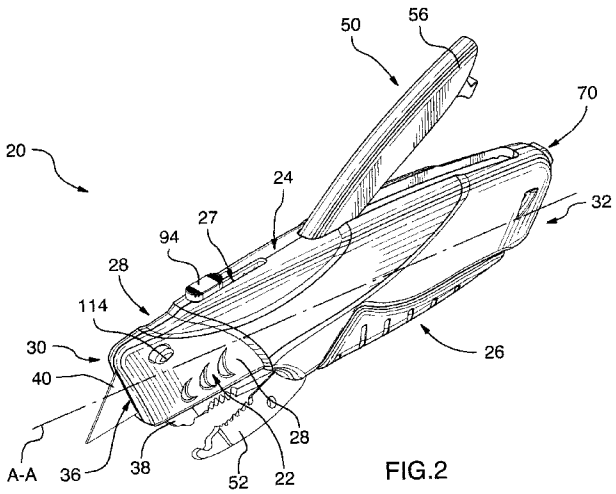

FIG.2

(57) Abstract: Amongst other things, there is provided a multiple purpose hand tool comprising an elongated housing having an internal cavity defined therein, and a knife blade slidably movable between being fully disposed within the cavity, and protruding from a slot in the housing. A lever is rotatably mounted about a pivot point, and has a movable tool jaw portion and a handle portion, each on opposite sides of the pivot. The movable tool jaw portion has one or more tools thereon. The housing has a fixed tool jaw portion positioned on its bottom. One or more of the tools is movable into operative proximity to the fixed tool jaw portion by rotation of the lever. The one or more tools may comprise one or more of wire cutters, wire strippers and wire crimpers.

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MULTIPLE PURPOSE HAND TOOL

FIELD OF THE INVENTION

[0001] The present invention relates to the field of hand tools and more particularly to an improved multiple purpose hand tool incorporating a utility knife and one or more additional tools.

BACKGROUND OF THE INVENTION

[0002] Different jobs require different tools. As such, a person needing to perform a number of different tasks will typically require multiple tools, which are often provided each separate from the others. It is unduly cumbersome for one to carry every tool that may be required, even if employing a tool belt or a tool box. It is desirable to minimize the volume and weight of tools carried without lessening functionality of the arsenal of tools carried.

[0003] It is known in the art to provide multiple different implements in a single one multiple purpose hand tool. Such multiple purpose hand tools allow for savings in terms of volume, weight, and cost. Moreover, the person using the multiple purpose hand tool will need to carry a lower number of separate tools in order to be able to do the same number of distinct tasks as would be possible with single purpose hand

tools, or this person can carry the same number of items and have the means to perform a broader range of tasks.

[0004] It is desirable for a multiple purpose hand tool to be configured such that the user may quickly transition between the various different implements provided. Prior art multiple purpose hand tools have failed to exhibit such a property. In this regard, it is desirable to provide a multiple purpose hand tool whereon the different implements thereof are operative at the same end of the multiple purpose hand tool, a feature that has notably not been provided in the prior art. Very often, different implements are provided at different ends of the multiple purpose hand tool. For example, pliers may be provided at one longitudinal end of a multiple purpose hand tool, and a stamp or a cutter may be provided at the opposite end, for use in, for example, a pounding style. Such a configuration can require drastic repositioning of the hand of the user on the multiple purpose hand tool (e.g., by way of reversing the longitudinal orientation of the multiple purpose hand tool in the hand of the user). Such manipulation is awkward (particularly where the user is on a ladder, or is otherwise engaged in an operation wherein concentration at a relatively high level is required), time-consuming, and potentially dangerous in

instances where one or more of the implements of the multiple purpose hand tool include sharp objects which may puncture the hand of the user during such a transition.

[0005] Moreover, each implement included in a multiple purpose hand tool may require some manipulation by the user (e.g., extension or retraction of a knife blade, closing of the mouth of pliers, etc.). It is particularly desirable to provide a multiple purpose hand tool that allows use of the hand of the user to apply force with a lever, as such application is essential to the function of many implements, while still having the multiple purpose hand tool positioned so as to allow use of the remaining implements without drastic re-positioning of the hand of the user on the tool. Notwithstanding such desirability, such a feature is notably not disclosed by the relevant prior art.

SUMMARY OF THE INVENTION

[0006] In accordance with the present invention, there is disclosed a multiple purpose hand tool comprising an elongated housing, a knife blade and a lever. The elongated housing has a top, a bottom, a plurality of sides, a front end and a rear end. The elongated housing has an internal cavity defined therein, and the front end has a slot formed therein in

communication with the internal cavity. The elongated housing has its major axis running through the front end and the rear end of the elongated housing. The knife blade is slidably movable between an extended position and a retracted position. In the retracted position the knife blade is fully disposed within the internal cavity, and in the extended position at least a portion of the knife blade protrudes through the slot. The lever is rotatably mounted about a pivot point defined by a pivot on the elongated housing. The lever has a movable tool jaw portion and a handle portion, each on opposite sides of the pivot. The movable tool jaw portion has one or more tools thereon. The lever is rotatable between an engaged configuration and a disengaged configuration. The elongated housing further comprises a fixed tool jaw portion positioned on the bottom of the elongated housing, and positioned substantially adjacent to the front end of the elongated housing. In the engaged configuration, at least one of the one or more tools is in operative proximity to the fixed tool jaw portion, and the handle portion is in close adjacent proximity to the top of the elongated housing, towards the rear end of the elongated housing. In the disengaged configuration both of the handle portion and the movable tool jaw portion are positioned substantially remotely from the

elongated housing. The one or more tools comprise one or more of wire cutters, wire strippers and wire crimpers.

[0007] According to another aspect of the invention, the lever further comprises an intermediate portion interposed between the movable tool jaw portion and the handle portion, within which intermediate portion the lever is rotatably mounted.

[0008] According to another aspect of the invention, the movable tool jaw portion has a tool jaw axis, the handle portion has a handle portion axis and the intermediate portion has an intermediate portion axis. The intermediate portion axis is angularly offset from one or more of the handle portion axis and the tool jaw portion axis.

[0009] According to another aspect of the invention, the handle portion axis and the tool jaw portion axis are substantially parallel to one another.

[0010] According to another aspect of the invention, the pivot is substantially normal to the longitudinal axis and disposed substantially centrally along the length of the elongated housing.

[0011] According to another aspect of the invention, the pivot is attached to one or more of the sides of the elongated housing.

[0012] According to another aspect of the invention, the pivot is a pivot pin disposed within the internal cavity and the lever is partially disposed within the internal cavity.

[0013] According to another aspect of the invention, the lever is biased towards being positioned in the disengaged configuration.

[0014] According to another aspect of the invention, the invention further comprises a coil spring disposed within the internal cavity and engaged with the lever and a catch pin to bias the lever towards the disengaged configuration.

[0015] According to another aspect of the invention, the biased rotation of the lever away from the engaged configuration is restrained by engagement of the handle portion of the lever with an opposed edge of the elongated housing, which opposed edge acts as a stop means thereagainst.

[0016] According to another aspect of the invention, a multiple purpose hand tool according to the present invention further comprises a releasable catch member mounted on the elongated housing and adapted to retain the multiple purpose hand tool in a stored configuration wherein the handle portion of the lever is positioned substantially adjacent to the top of the elongated housing, and the movable tool jaw portion substantially contacts the fixed tool jaw portion.

[0017] According to another aspect of the invention, the catch member releasably engages with the handle portion of the lever.

[0018] According to another aspect of the invention, the lever further comprises a hook member extending from the handle portion thereof for engagement with the catch member.

[0019] According to another aspect of the invention, the invention further comprises a container engagable with the elongated housing, and for storing one or more replacement knife blades therein.

[0020] According to another aspect of the invention, the container is attached to the elongated housing and is movable

between a closed position and an open position, wherein, in the closed position substantially the entirety of the container is disposed within the internal cavity so as to prevent access to the replacement blades, and wherein, in the open position easy access to the replacement blades is possible.

[0021] According to another aspect of the invention, the container further comprises a retention mechanism engagable with the elongated housing to selectively retain the container in the closed position.

[0022] According to another aspect of the invention, the container is rotatably mounted on the elongated housing for movement between the open position and the closed position.

[0023] According to another aspect of the invention, the container is rotatable about a pivot axis disposed substantially adjacent the rear end of the elongated housing.

[0024] According to another aspect of the invention, the container further comprises a lock mechanism for selectively retaining the container in the closed position.

[0025] According to another aspect of the invention, the invention further comprises a knife blade carrier assembly for receiving and retaining the knife blade therein, the assembly being engagable with the knife blade for slidably moving the knife blade substantially parallel to the major axis of said elongated housing between the retracted position and the extended position, the assembly being at least partially disposed within the internal cavity of the elongated housing.

[0026] According to another aspect of the invention, the assembly includes a mechanism engagable with the knife blade and the elongated housing for locking the knife blade in the retracted position and in the extended position.

[0027] According to another aspect of the invention, the invention further comprises a mechanism for releasing the blade from the multiple purpose hand tool when the blade is in the extended position.

[0028] According to another aspect of the invention, the elongated housing has an aperture defined in one or more of the sides thereof and wherein the mechanism for releasing the blade comprises an activation button extending substantially perpendicular to the longitudinal axis and engagable with the

blade when the blade is in the extended position so as to disengage the blade from the means for slidably moving the knife blade and the means for locking the knife blade.

[0029] According to the present invention there may also be provided a multiple purpose hand tool comprising an elongated housing, a knife blade carrier assembly, and a lever. The elongated housing has a top, a bottom, a plurality of sides, a front end, a rear end, and has an internal cavity defined therein. The front end has a slot formed therein that is in communication with the internal cavity. The elongated housing has its major axis running through the front end and the rear end. The knife blade carrier assembly is disposed within the internal cavity and proximal to the front end of the elongated housing, and is adapted to receive and retain a knife blade therein. The lever is rotatably mounted about a pivot point defined by a pivot on the elongated housing. The lever has a movable tool jaw portion and a handle portion, each on opposite sides of the pivot. The movable tool jaw portion has one or more tools thereon. The lever is rotatable between an engaged configuration and a disengaged configuration. The elongated housing further comprises a fixed tool jaw portion positioned on the bottom of the elongated housing (in substantial alignment with the axis), and positioned

substantially adjacent to the front end of the elongated housing. In the engaged configuration, at least one of the one or more tools is in operative proximity to the fixed tool jaw portion, and the handle portion is in close adjacent proximity to the top of the housing, towards the rear end of the housing. In the disengaged configuration both of the handle portion and the movable tool jaw portion are positioned substantially remotely from the elongated housing. The one or more tools comprise one or more of wire cutters, wire strippers and wire crimpers.

[0030] Other advantages, features and characteristics of the present invention, as well as methods of operation and functions of the related elements of the structure, and the combination of parts and economies of manufacture, will become more apparent upon consideration of the following detailed description and the appended claims with reference to the accompanying drawings, the latter of which is briefly described hereinbelow.

BRIEF DESCRIPTION OF THE DRAWINGS

[0031] The novel features which are believed to be characteristic of the present invention, as to its structure, organization, use and method of operation, together with

further objectives and advantages thereof, will be better understood from the following drawings in which a presently preferred embodiment of the invention will now be illustrated by way of example. It is expressly understood, however, that the drawings are for the purpose of illustration and description only, and are not intended as a definition of the limits of the invention. In the accompanying drawings:

[0032] **Figure 1** is a front left perspective view from above of a multiple purpose hand tool according to the present invention, with a lever shown in an engaged configuration and a knife blade shown in phantom outline an extended position;

[0033] **Figure 1A** is a left side elevational view of the multiple purpose hand tool shown in **Figure 1**, with a segment of the elongated housing removed therefrom for ease of illustration of the contents of internal cavity of the elongated housing;

[0034] **Figure 2** is a similar to **Figure 1**, with the lever shown in a disengaged configuration, and the knife blade shown in an extended position;

[0035] **Figure 2A** is a left side elevational view of the multiple purpose hand tool shown in **Figure 2**, with a segment of the elongated housing removed therefrom for ease of illustration of the contents of the internal cavity of the elongated housing;

[0036] **Figure 3** is a rear right exploded perspective view of the multiple purpose hand tool of **Figure 1**, with the knife blade shown in an extended position;

[0037] **Figure 4** is an enlarged view of the lever seen in **Figures 1A and 2A**;

[0038] **Figure 5** is a view similar to **Figure 1**, but on a smaller scale, with the knife blade removed from the multiple purpose hand tool by the hand of a user, such hand being shown in phantom outline;

[0039] **Figure 6** is a left front perspective view from below of the multiple purpose hand tool of **Figure 1A**;

[0040] **Figure 7** is a view similar to **Figure 6**, with the knife blade removed from the multiple purpose hand tool;

[0041] **Figure 8** is an enlarged view of the enclosed portion 8 of **Figure 1A** with the container shown in its closed configuration;

[0042] **Figure 9** is a view similar to **Figure 1A**, with the container shown in its open configuration; and,

[0043] **Figure 10** is an enlarged view of the enclosed portion 10 of **Figure 9**.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

[0044] Referring now to the drawings, there will be seen a hand tool 20 comprising an elongated housing 22, a knife blade 40 and a lever 50. The elongated housing 22 has a top 24, a bottom 26, a plurality of sides 28, a front end 30 and a rear end 32, as seen in Figure 1. The elongated housing 22 may be comprised of a first segment 22a and a second segment 22b, as shown in Figure 3; however, one skilled in the art will readily appreciate that the elongated housing 22 could be provided having more than two segments. A rubberized or plastic overgrip 46 may additionally be provided for the comfort of a user (not shown, save for a hand 18 shown in

phantom outline in Figure 5), and the overgrip 46 may be formed as complementary portions 46a and 46b overlying the first 22a and second 22b segments of the elongated housing 22, as shown in Figure 3.

[0045] An internal cavity 34 is defined in the elongated housing 22 between the segments 22a and 22b thereof. The front end 30 of the housing 22 has a slot 36 formed therein, as seen in Figure 1, that is in communication with the internal cavity 34. The major axis A-A of the elongated housing 22 runs through its front end 30 and its rear end 32, as shown in Figure 1. A fixed tool jaw portion 38 of the elongated housing 22 is positioned at the bottom 26 of the elongated housing 22, substantially adjacent to the front end 30 thereof, as shown in, for example, Figure 1.

[0046] The hand tool 20 also includes a knife blade carrier assembly 86 that is disposed at least partially within the internal cavity 34, as will be appreciated from a consideration of Figures 1 and 3. The knife blade carrier assembly 86 is located proximally to the front end 30 of the elongated housing 22, and is adapted to receive and retain the knife blade 40 therein, as shown in, for example, Figure 1A. For the purposes of retaining the knife blade 40, and for

effecting movement thereof (as will be described in more detail below) the knife blade carrier assembly 86 includes two retention pegs 88, that are engagable with corresponding u-shaped slots 48 defined in the knife blade 40, as shown in, for example, Figure 6. One skilled in the art will recognize that the hand tool 20 could be provided to consumers without the knife blade 40, and that such a knife blade 40 could be later installed.

[0047] The knife blade 40 is slidably movable between an extended position, shown in, for example, Figures 2 and 6, and a retracted position, shown in, for example, Figures 1A and 9. In the retracted position, the knife blade 40 is fully disposed within the internal cavity 34, as shown in Figures 4, 5 and 9. In the extended position, at least a portion of the knife blade 40 protrudes through the slot 36, as shown in, for example, phantom outline in Figure 1, and in Figure 6 to facilitate cutting action of the hand tool 20 as a utility knife.

[0048] The knife blade carrier assembly 86 is engagable with the knife blade 40 for slidably moving the knife blade 40 substantially parallel to the major axis A-A of the elongated housing 22 between the retracted position and the extended

position. For this purpose, the knife blade carrier assembly 86 also includes a flexible arm 92, and a thumb slide 94 extending upwardly therefrom and out of a guide opening 27 in the top 24 of the elongated housing 22. The knife blade carrier assembly 86 is also preferably engagable with the knife blade 40 and the elongated housing 22 for locking the knife blade 40 in the retracted position and in the extended position. To this end, the knife blade carrier assembly 86 includes a male detent member 102 extending upwardly from the flexible arm 92, as shown in, for example, Figures 1A, 2A, 3 and 9, that is engagable with each of a plurality of slots 104 formed in the underside of the elongated housing 22, as shown engaged in, for example, Figures 1A and 9. Multiple slots 104 are provided so as to enable positioning of the knife blade 40 in each of its extended and retracted positions as described above, and to allow for positioning of the knife blade 40 in one or more intermediate positions (in the Figures, the knife blade 40 is not shown in such intermediate positions). Depression of the thumb slide 94 causes downward flexion of the flexible arm 92, which allows for disengagement of the male detent member 102 from a previously engaged slot 104. Force can then be applied to the thumb slide 94 in directions parallel to the major axis A-A of the elongated housing 22, to move the thumb slide 94 within the guide opening 27. For

example, in Figure 1 the thumb slide 94 and the blade 40 are shown in phantom outline (i.e., the thumb slide in phantom outline is indicated as 94a) in their respective positions when the blade 40 is in the extended position, and the thumb slide 94 is shown solidly as it would be positioned when the blade 40 is in its retracted position to adjust the position of the knife blade 40 as desired. Removal of downward force on the thumb slide 94 will allow re-engagement of the male detent member 102 with a selected one of the slots 104, which engagement is described above.

[0049] The hand tool 20 also includes a mechanism 110 for releasing the knife blade 40 from the hand tool 20 when the knife blade 40 is in the extended position. The mechanism 110 includes an arm 112, a activation button 114, and a body 116 therebetween, as best seen in Figure 3. The mechanism 110 is attached to the interior of one of the sides 28 of the elongated housing 22 by engagement of the arm 112 with a suitably dimensioned female receptor 29, the receptor 29 being best shown in Figure 3. The elongated housing 22 has an aperture 44 defined in one or more of the sides 28 thereof. The activation button 114 protrudes through the aperture 44 substantially perpendicular to the major axis A-A of the elongated housing 22, as will be appreciated from a

consideration of Figure 1, and is engagable with the knife blade 40, by way of direct engagement with the a side face of the knife blade carrier assembly 86, when the knife blade 40 is in the extended position. Depression of the activation button 114 in the direction of arrow "A" (shown in Figures 5 and 6), results in flexion of the body 116 of the mechanism 110, which in turn causes disengagement of the knife blade 40 from the retention pegs 88 of the knife blade carrier assembly 86. This allows the user to remove the knife blade 40 by pulling it parallel to the major axis A-A (for example, in the direction of arrow "B", seen in Figures 5 and 6, with the hand 18 of the user shown in phantom outline in Figure 5).

[0050] The lever 50, shown enlarged in Figure 4, is rotatably mounted about a pivot point 60 defined by a pivot pin 62. The pivot pin 62 is disposed within the internal cavity 34 and attached to one or more of the sides 28 of the elongated housing 22, as shown in Figures 1A, 2A and 3. The pivot pin 62 is preferably oriented substantially normal to the major axis A-A of the elongated housing 22, and is disposed substantially centrally along the length of the elongated housing 22 (though it may, in some embodiments, be closer to the front end 30 of the elongated housing 22 than to its rear end 32).

[0051] The lever 50 is at least partially disposed within the internal cavity 34, though in some embodiments only the portions of the lever 50 that engage the pivot pin 62 may be disposed within the cavity 34, and the remainder may be positioned externally to the housing 22. The lever 50 has a movable tool jaw portion 52 and a handle portion 56, each positioned on opposite sides of the pivot pin 62.

[0052] The movable tool jaw portion 52 of the lever 50 has one or more tools 58 thereon, as best shown in Figure 4. The one or more tools 58 may comprise one or more of wire crimpers 58a, wire strippers 58b (which may be configured so as to allow for stripping of wires of different gauges) and wire cutters 58c. A complementary set of mating tools 38a, 38b, and 38c is defined in the fixed tool jaw portion 38, as best shown in Figure 2A. The tools 58a, 58b and 58c and the complementary mating tools 38a, 38b, and 38c are operatively engagable about a workpiece (not shown), as will be described in more detail hereinbelow.

[0053] The lever 50 is rotatable between an engaged configuration and a disengaged configuration. In the disengaged configuration both of the handle portion 56 and the

movable tool jaw portion 52 are positioned substantially remotely from the elongated housing 22, as shown in, for example, Figures 2 and 2A. An intermediate portion 54 of the lever 50 is, as illustrated, preferably interposed between the movable tool jaw portion 56 and the handle portion 52 and is continuous therewith. The intermediate portion 54 has a mounting hole 55 passing laterally therethrough, which hole 55 is used to mount the lever 50 on the pivot pin 62 for rotation about the pivot pin 62 between its various operative positions as further described herein.

[0054] As best shown in Figure 4, the movable tool jaw portion 56 has a tool jaw axis T-T, the handle portion 56 has a handle portion axis H-H and the intermediate portion 54 has an intermediate portion axis I-I. The intermediate portion axis I-I is angularly offset from one or more of the handle portion axis H-H and the tool jaw portion axis T-T, though it need not necessarily be so offset. As seen in Figure 4, the handle portion axis H-H and the tool jaw portion axis T-T are preferably substantially parallel to one another.

[0055] In the engaged configuration of the lever 50, at least one of the one or more tools 58 is in operative proximity to its mating tool on the fixed tool jaw portion 38,

and the handle portion 56 approaches the top of the elongated housing 22 towards its rear end 32. In this specification and the appended claims, the term "operative proximity" means any position of the lever 50 wherein one or more of the tools 58a, 58b and 58c is sufficiently close to its complementary mating tool 38a, 38b, or 38c, as the case may be, so as to together engage a workpiece positioned therebetween, such that the function of the particular tool (e.g., wire cutter, wire stripper, wire crimper) may be effected. In this regard, it is noted that one or more of the tools 58a, 58b and 58c may operatively contact its complementary mating tool 38a, 38b, or 38c as in the case of, for example, the wire cutters wherein the wire cutter 58c on the movable tool jaw portion 52 may contact the complementary wire cutter 38c on the fixed tool jaw portion 38 upon cutting or breakage of, for example, a wire (not shown) positioned therebetween and cut thereby by operation of the lever 50. The lever 50 preferably operates as a first class lever, whereby the handle portion 56 of the lever 50 is adapted to receive a force applied by a hand of the user (not shown) - for example, by positioning of a palm of the user atop the handle portion 56 and the fingers of the user below the bottom 26 of the housing 22 and squeezing the palm and fingers together - the force causing rotation of the lever 50 about the pivot pin 62 (as engaged by the mounting

hole 55 formed in the intermediate portion 54 of the lever 50). The pivot pin 62 acts as a fulcrum and translates the applied force at the handle portion 56 into a force at the movable tool jaw portion 52 in a direction substantially towards the bottom 26 of the housing 22 (and more particularly, toward the fixed tool jaw portion 38).

[0056] The lever 50 is biased towards being positioned in the disengaged configuration, with the biasing accomplished by way of, for example, a coil spring 64 disposed within the internal cavity 34, and engaging by its opposite ends an aperture 57 formed in the intermediate portion 54 and a catch pin 65 formed in the second segment 22b of the housing 22, as shown in, for example, Figure 9. The extent of possible rotation of the lever 50 away from the engaged configuration may be restrained by, for example, engagement of the movable tool jaw portion 52 and the handle portion 56 with the elongated housing 22. More particularly, the handle portion 56 may impact an opposed edge 42 of the elongated housing 22, as shown in Figure 2, with such opposed edge 42 acting as a stop means for further rotation of the handle portion 56 under the urging of the coil spring 64.

[0057] The hand tool 20 preferably also includes a rotatable catch member 70 that is adapted to retain the hand tool 20 in its stored configuration. In this stored configuration, shown in, *inter alia*, Figures 1A and 9, the handle portion 56 of the lever 50 is positioned substantially adjacent to the top 24 of the elongated housing 22 (and may be partially within the cavity 34), and the movable tool jaw portion 52 substantially contacts the fixed tool jaw portion 38. The catch member 70 preferably has a catch arm 72, as best shown in Figure 9, that releasably engages a hook member 66 extending downwardly and rearwardly from the handle portion 56 when the catch member 70 is rotated in the direction of arrow "C" of Figure 1A, to its locked configuration, shown in Figures 1A and 9. The catch member 70 preferably includes a first retention member 73 extending therefrom substantially toward the front end 30 of the elongated housing 22. The first retention member 73 is shaped and configured so as to be engagable by seating of its convex head within the tip of a first concavely dimpled post 31 extending from the elongated housing 22 (as seen in Figures 2A, 3, 6 and 7; and hidden in Figures 1A, 8, 9, and 10 by the first retention member 73), so as to help retain the catch member 70 in its locked position.

[0058] The first detent member 74 of the catch member 70 may be unseated from the first dimpled post 31 by rotation of the catch member 70 in the direction of arrow "D" of Figure 2A. Further such rotation of the catch member 70 will move it to its unlocked configuration, shown in, for example, Figure 2A, and will release the lever 50 (by disengagement of the catch arm 72 from the hook member 66) under the biasing pull of the coil spring 64. The catch member 72 preferably includes a second retention member 75 (similar to the first 73) that is similarly shaped and configured to be engagable by seating of its head within the tip of a second concavely dimpled post 33 extending from the side 28 of the elongated housing 22 (as seen in Figures 1A, 8, 9, and 10; and hidden in Figures 2A, 3, 6 and 7 by the second retention member 75), so as to help retain the catch member 70 in its unlocked position.

[0059] One skilled in the art will readily appreciate that, while both shown on the same one of the segments 22a,22b of the housing 22, each of the dimpled posts 31,33 could be provided on a different one of the segments 22a,22b with corresponding changes in the orientations of the detent members 74,76, as necessary for operative seating engagement therewith.

[0060] The hand tool 20 preferably also includes a container 80 that is engagable with the elongated housing 22, and which is adapted for storing one or more replacement knife blades 40a therein. The container 80 is preferably attached to the elongated housing 22 and is movable between a closed position (see, for example, Figures 8 and 9) and an open position (see, for example, Figures 10 and 11). In the closed position, substantially the entirety of the container 80 is disposed within the internal cavity 34 of the elongated housing 22. The container 80 preferably includes a retention mechanism 82 including a latch member 84 and a resiliently deformable arm 85, which latch member 84 is engagable with a lower edge 35 of the elongated housing 22, to selectively retain the container 80 in the closed position. The latch member 84 is formed to fit around the lower edge 35 in such a manner as to be easily slidable thereon and therefrom. When engaged with the lower edge 35, the latch member 84 may be slid off of the lower edge 35 by manual movement of the latch member 84 parallel to the major axis A-A and toward the rear end 32 of the elongated housing 22. Such movement of the latch member 84 is allowed by deformation of the resiliently deformable arm 85 that connects the latch member 84 to the rest of the container 80. As its name suggests, the

resiliently deformable arm will revert to its original shape (i.e., substantially as when the latch member 84 is engaged with the lower edge 35; see, for example, Figure 1A) when the aforementioned manual force is removed. As the container 80 is preferably mounted on the elongated housing 22 so as to be rotatable about a pivot axis C-C disposed substantially adjacent the rearend 32 of the elongated housing 22, it may be rotated from the closed position once the latch member 84 has been so disengaged.

[0061] As the container 80 is moved back into the closed position, the latch member 84 may be moved as before, so as to deform the arm 85 and allow passage of a portion of the latch member 84 beyond the lower edge 35. Releasing the force on the latch member 84 allows it to snap back into place be reversion of the arm 85 to its original shape (as discussed above). One skilled in the art will readily appreciate that such manual manipulation of the latch member 84 may not, in some instances, be necessary in order to engage the latch member 84 with the lower edge 35. The latch member 84 may be provided with a beveled or rounded upper camming surface, so as to allow deformation of the arm 85 to occur automatically by impact of the latch member 84 with the lower edge (caused by rotation of the container 80 towards the closed position),

such that the latch member 84 will snap into place about the lower edge 35 under urging of the arm 85 as it reverts to substantially its original shape.

[0062] In use, the hand tool 20 may be provided without the blade 40 installed therein. In such instances, the knife blade carrier assembly 86 should be positioned as if the knife blade 40 is in its extended position (See Figures 2 and 5). The user may then install the knife blade 40 (or, for example, one of the replacement blades 40a from the container 80) by depressing the activation button 114 in the direction of arrow "B" (seen in Figures 5 and 6), and while holding the activation button 114 in that depressed position, thereafter inserting the knife blade 40 into the slot 36 - i.e., in a direction parallel to the major axis A-A, and opposite to the direction of arrow "A", see in Figures 5 and 6. The activation button 114 may then be released, and the knife blade 40 manipulated (if necessary) such that the retention pegs 88 engage the u-shaped slots 48 as described hereinabove. It is noted that removal of the knife blade 40 was described in some detail hereinabove, and that installation is, essentially, a reversal of that procedure.

[0063] A workpiece (not shown) can be operated upon using the hand tool 20 of the present invention. The exact positioning of the workpiece between the movable tool jaw portion 52 and the fixed tool jaw portion 38 will be determined by which tool is desired to be used. For example, the wire cutters (collectively made up of the wire cutter 58c on the movable tool jaw portion 52 and the complementary mating wire cutter 38c on the fixed tool jaw portion 38) will be employed by placement of the workpiece (i.e., a wire, or another item to be cut) in position as described above with respect to the wire strippers (save for the fact that the workpiece wire would be in line with the wire cutters 58c). Movement of the lever 50 into the engaged configuration should then result in cutting of the wire. The various uses for a utility-type knife (such as is provided when the knife blade 40 is in the extended position) are well-known to a person of skill in the art, and need not be described in further detail, save for emphasizing the ease of access and transition from use of the tools associated with the movable jaw portion 52 to use of the utility knife function of the hand tool 20 of the present invention. That is, in view of the placement of the slot 36 adjacent the same end of the elongated housing 22 as the fixed tool jaw portion 38, the same general hand positioning of a user for both operations is possible. That

is, provision of the slot 36 (i.e. whereat the knife blade 40 may be used for cutting) and the fixed tool jaw portion 38 (i.e., whereat the other tools may be used) at the front end 30 of the housing 22 allows the user to quickly transition between the knife and the other hand tools without the need to turn the elongated housing 22 from end to end, as is commonly required of multiple purpose tools of the prior art.

[0064] Replacement blades 40a may be removed from, or placed in, the container 80 as follows. If starting with the container 80 in the closed position (see Figure 1A), the retention mechanism 82 should be disengaged by movement of the latch member 84 towards the rear end 32 of the elongated housing 22, as described in some detail hereinabove. The container 80 may then be rotated about its pivot axis C-C so as to be moved to the open position (see Figure 9) whereat the replacement blades 40a may be accessed (or placed in) the container 80. If starting in the open position, replacement blades 40a may be removed from (or placed in) the container 80. The container 80 may be rotated about its pivot axis C-C so as to be moved to the closed position, whereat the latch member 84 will snap or be manually snapped into engagement with the lower edge 35 of the elongated housing 22, as described hereinabove.

[0065] When the lever 50 is in the engaged configuration, the catch arm 72 may be engaged with the hook member 66 on the handle portion 56 of the lever 50 by rotation in the direction of arrow "C" in Figure 1A from its unlocked position to its locked position. The hand tool 20 may thereby be retained in the stored configuration. The catch arm 72 maybe released from its engagement with the hook member 66 by rotation of the catch member 70 in the direction of arrow "D" in Figure 2A, so as to allow release of the lever 50 to the biasing pull of the coil spring 64.

[0066] Other modifications and alterations may be used in the design and manufacture of other embodiments according to the present invention without departing from the spirit and scope of the invention, which is limited only by the accompanying claims.

CLAIMS:

1. A multiple purpose hand tool comprising:

(a) an elongated housing having a top, a bottom, a plurality of sides, a front end and a rear end; with said elongated housing having an internal cavity defined therein, said front end having a slot formed therein in communication with said internal cavity, and with said elongated housing having its major axis running through said front end and said rear end;

(b) a knife blade slidably movable between a retracted position and an extended position, wherein in said retracted position said knife blade is fully disposed within said internal cavity, and in said extended position at least a portion of said knife blade protrudes through said slot; and,

(c) a lever rotatably mounted about a pivot point defined by a pivot on said elongated housing, said lever having a movable tool jaw portion and a handle portion, each on opposite sides of said pivot, said movable tool jaw portion having one or more tools thereon;

wherein said lever is rotatable between an engaged configuration and a disengaged configuration;

wherein said elongated housing further comprises a fixed tool jaw portion positioned on the bottom of

said elongated housing (in substantial alignment with said axis), and positioned substantially adjacent to said front end of said elongated housing;

wherein, in said engaged configuration, at least one of said one or more tools is in operative proximity to said fixed tool jaw portion, and said handle portion is in close adjacent proximity to said top of said housing, towards said rear end of said housing;

wherein in said disengaged configuration both of said handle portion and said movable tool jaw portion are positioned substantially remotely from said elongated housing; and

wherein said one or more tools comprise one or more of wire cutters, wire strippers and wire crimpers.

2. A multiple purpose hand tool according to claim 1, wherein said lever further comprises an intermediate portion interposed between said movable jaw portion and said handle portion, and within which intermediate portion said lever is rotatably mounted as aforesaid.

3. A multiple purpose hand tool according to claim 2, wherein said movable tool jaw portion has a tool jaw axis, said handle portion has a handle portion axis and said intermediate portion has an intermediate portion axis, said intermediate portion axis being angularly offset from one or more of said handle portion axis and said tool jaw portion axis.

4. A multiple purpose hand tool according to claim 3, wherein said handle portion axis and said tool jaw portion axis are substantially parallel to one another.

5. A multiple purpose hand tool according to claim 1, wherein said pivot is substantially normal to said longitudinal axis and disposed substantially centrally along the length of said elongated housing.

6. A multiple purpose hand tool according to claim 5, wherein said pivot is attached to one or more of said sides.

7. A multiple purpose hand tool according to claim 6, wherein said pivot is a pivot pin disposed within said internal cavity and said lever is partially disposed within said internal cavity.

8. A multiple purpose hand tool according to claim 1, wherein said lever is biased towards being positioned in said disengaged configuration.

9. A multiple purpose hand tool according to claim 8, further comprising a coil spring disposed within said internal cavity and engaged with said lever and a catch pin to bias said lever towards said disengaged configuration.

10. A multiple purpose hand tool according to claim 9, wherein said biased rotation of said lever away from said engaged configuration is restrained by engagement of said lever with an opposed edge of the elongated housing, which opposed edge acts as a stop means thereagainst.

11. A multiple purpose hand tool according to claim 1, further comprising a catch member mounted on the housing and adapted to retain said multiple purpose hand tool in a stored configuration, wherein said handle portion of said lever is positioned substantially adjacent to said top of said elongated housing and said movable tool jaw portion substantially contacts said fixed tool jaw pattern.

12. A multiple purpose hand tool according to claim 11, wherein said catch member releasably engages with said lever.

13. A multiple purpose hand tool according to claim 12, wherein said catch member is mounted adjacent the rear end of said housing and releasably engages said handle portion of said lever.

14. A multiple purpose hand tool according to claim 13, wherein said handle portion further comprises a hook member extending from said handle portion thereof for engagement with said catch member.

15. A multiple purpose hand tool according to claim 1, further comprising a container engagable with said elongated housing, and for storing one or more replacement knife blades therein.

16. A multiple purpose hand tool according to claim 15, wherein said container is attached to said elongated housing and is movable between a closed position and an open position; wherein, in said closed position substantially the entirety of said container is disposed within said internal cavity so as to prevent access to said replacement blades and, wherein, in

said open position easy access to said replacement blades is possible.

17. A multiple purpose hand tool according to claim 16, wherein said container further comprises a retention mechanism engagable with said elongated housing to selectively retain said container in said closed position.

18. A multiple purpose hand tool according to claim 17, wherein said container is rotatably mounted on said elongated housing for movement between said open position and said closed position.

19. A multiple purpose hand tool according to claim 18, wherein said container is rotatable about a pivot axis disposed substantially adjacent said rear end of said elongated housing.

20. A multiple purpose hand tool according to claim 19, wherein said container further comprises a lock mechanism for selectively retaining said container in said closed position.

21. A multiple purpose hand tool according to claim 1, further comprising a knife blade carrier assembly for

receiving and retaining said knife blade therein, said assembly being engagable with said knife blade for slidably moving said knife blade substantially parallel to said major axis of said elongated housing between said retracted position and said extended position, said assembly being at least partially disposed within said internal cavity of said elongated housing.

22. A multiple purpose hand tool according to claim 21, wherein said assembly includes a mechanism engagable with said knife blade and said elongated housing for locking said knife blade in said retracted position and in said extended position.

23. A multiple purpose hand tool according to claim 1, further comprising a mechanism for releasing said blade from said multiple purpose hand tool when said knife blade is in said extended position.

24. A multiple purpose hand tool according to claim 23, wherein said elongated housing has an aperture defined in one or more of said sides thereof and wherein said mechanism for releasing said knife blade comprises a activation button extending substantially perpendicular to said longitudinal

axis and engagable with said knife blade when said knife blade is in said extended position so as to disengage said knife blade from said means for slidably moving said knife blade and said means for locking said knife blade.

25. A multiple purpose hand tool comprising:

(a) an elongated housing having a top, a bottom, a plurality of sides, a front end and a rear end; with said elongated housing having an internal cavity defined therein, said front end having a slot formed therein in communication with said internal cavity, and with said elongated housing having its major axis running through said front end and said rear end;

(b) a knife blade carrier assembly disposed within said internal cavity and proximal to said front end of said elongated housing, and adapted to receive and retain a knife blade therein; and,

(c) a lever rotatably mounted about a pivot point defined by a pivot on said elongated housing, said lever having a movable tool jaw portion and a handle portion, each on opposite sides of said pivot, said movable tool jaw portion having one or more tools thereon;

wherein said lever is rotatable between an engaged configuration and a disengaged configuration;

wherein said elongated housing further comprises a fixed tool jaw portion positioned on the bottom of said elongated housing (in substantial alignment with said axis), and positioned substantially adjacent to said front end of said elongated housing;

wherein, in said engaged configuration, at least one of said one or more tools is in operative proximity to said fixed tool jaw portion, and said handle portion is in close adjacent proximity to said top of said housing, towards said rear end of said housing;

wherein in said disengaged configuration both of said handle portion and said movable tool jaw portion are positioned substantially remotely from said elongated housing; and

wherein said one or more tools comprise one or more of wire cutters, wire strippers and wire crimpers.

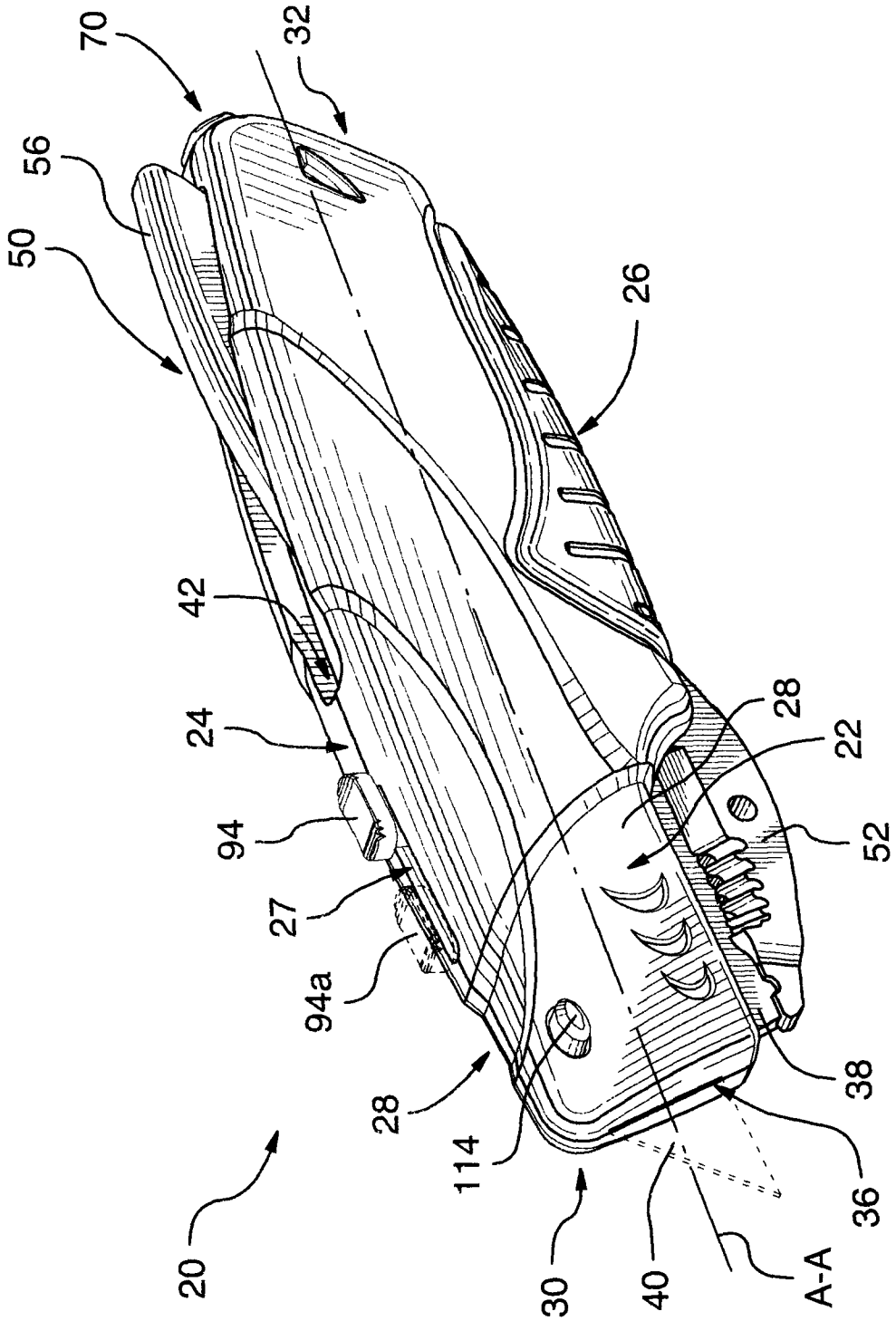

FIG.1

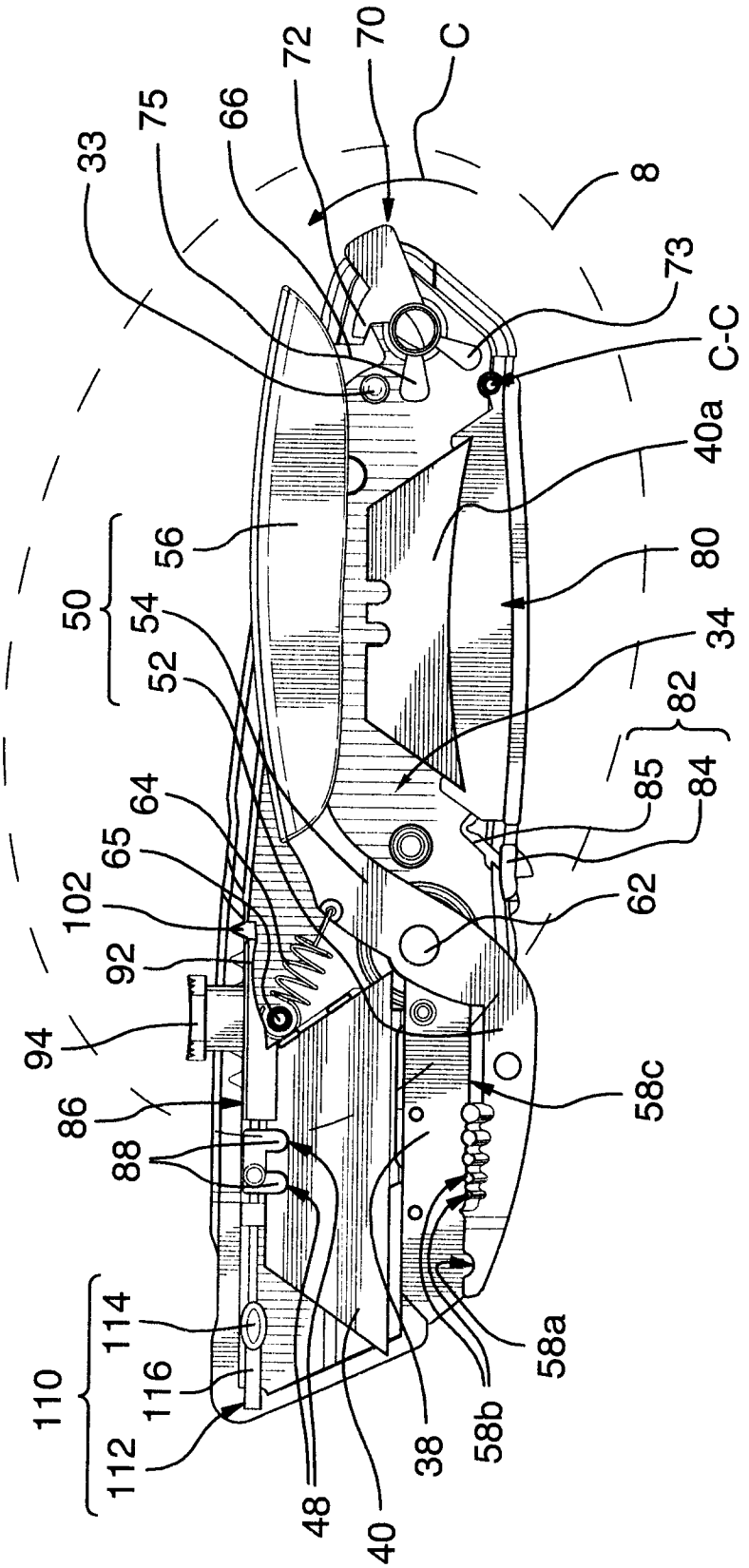
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FIG.1A

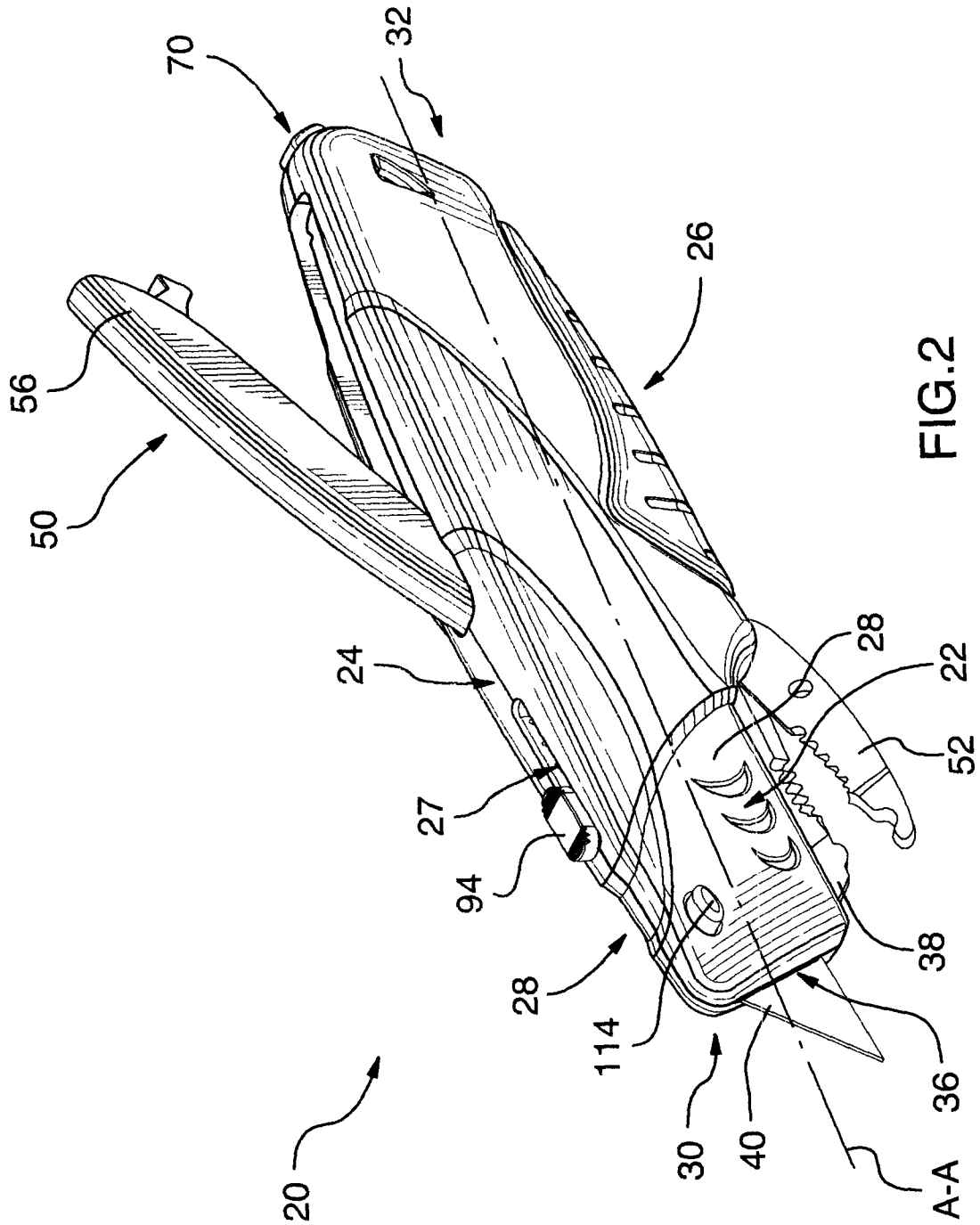
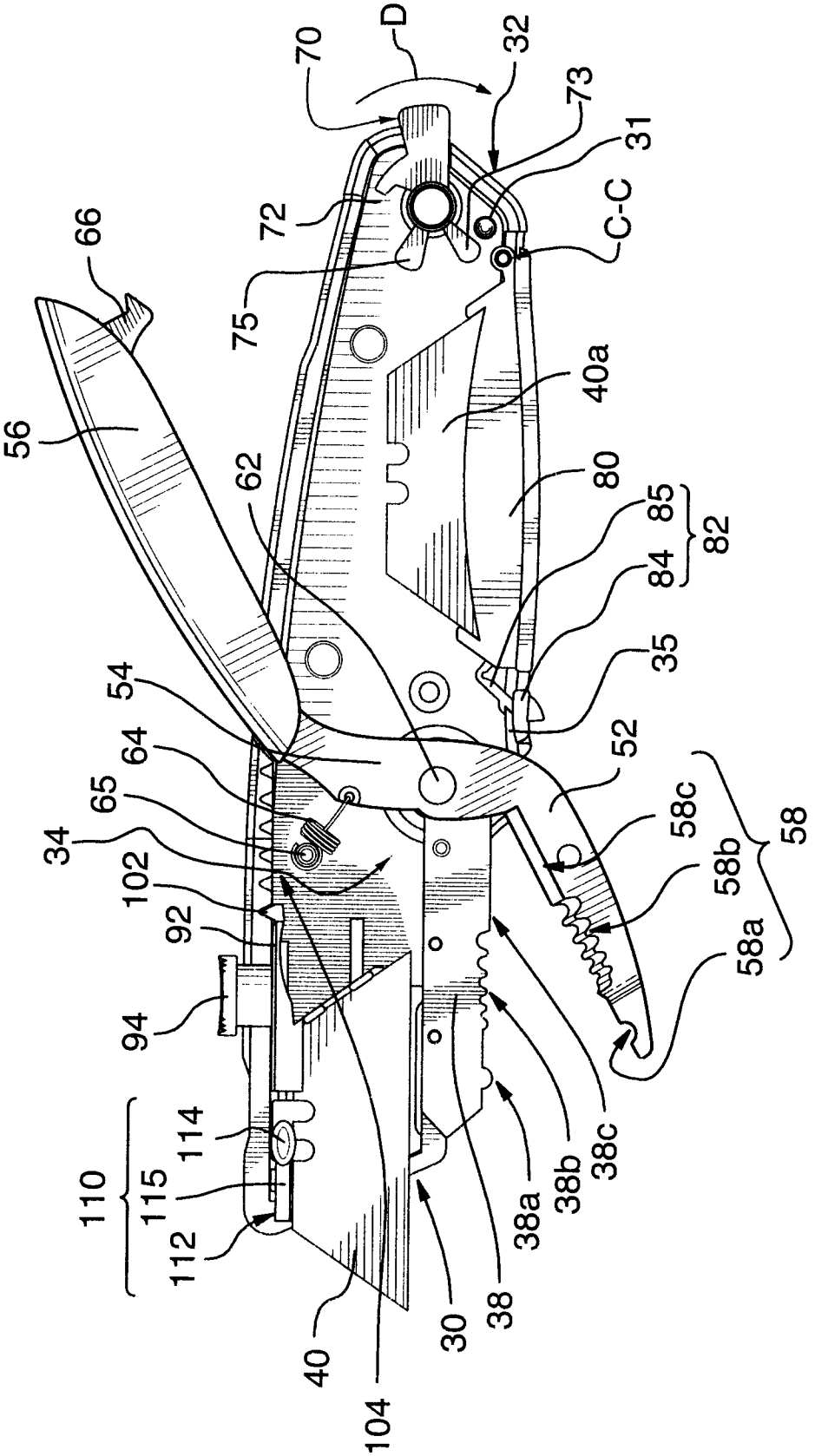


FIG.2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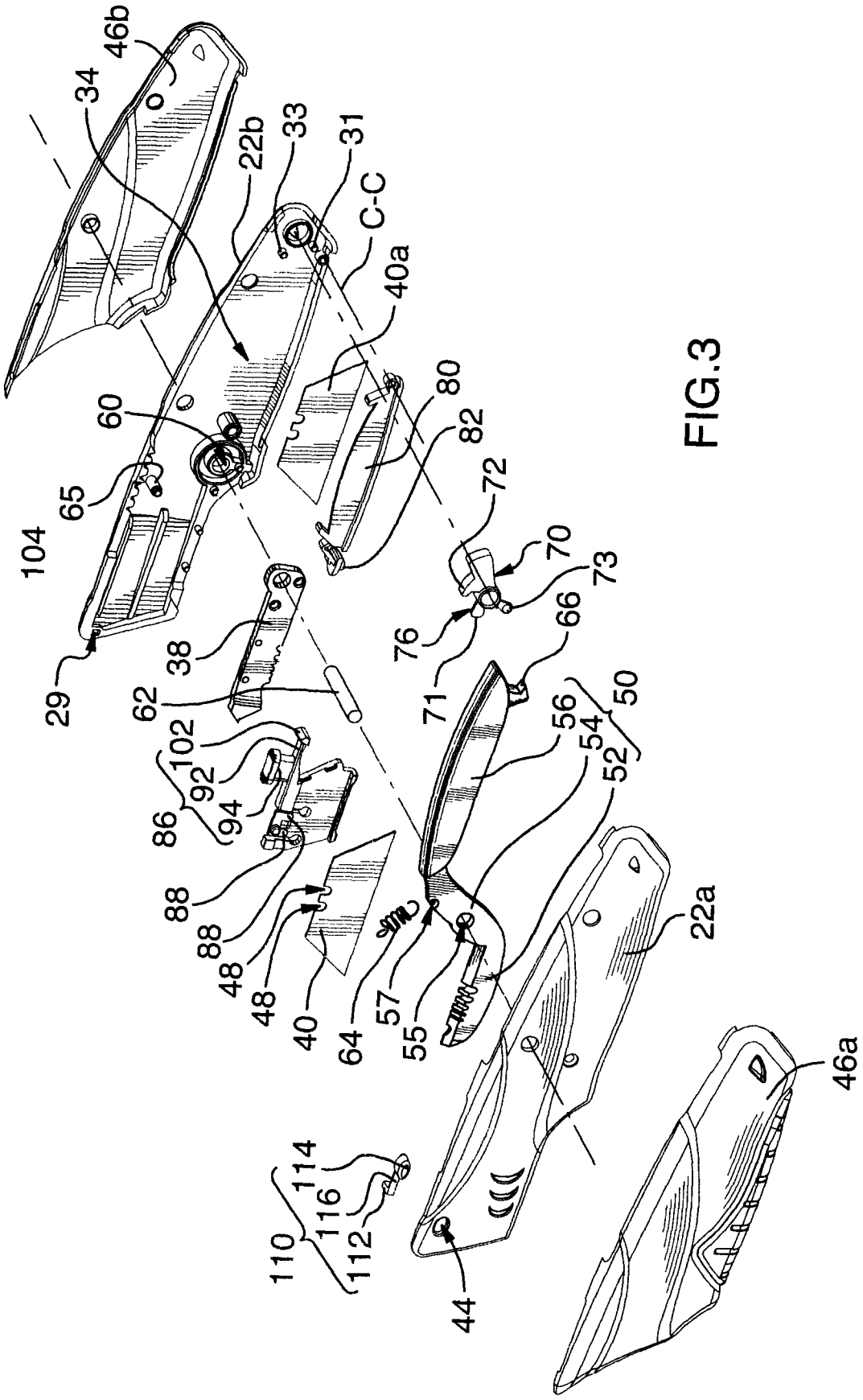
38a
38b
38c

FIG.2A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46a
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FIG.3

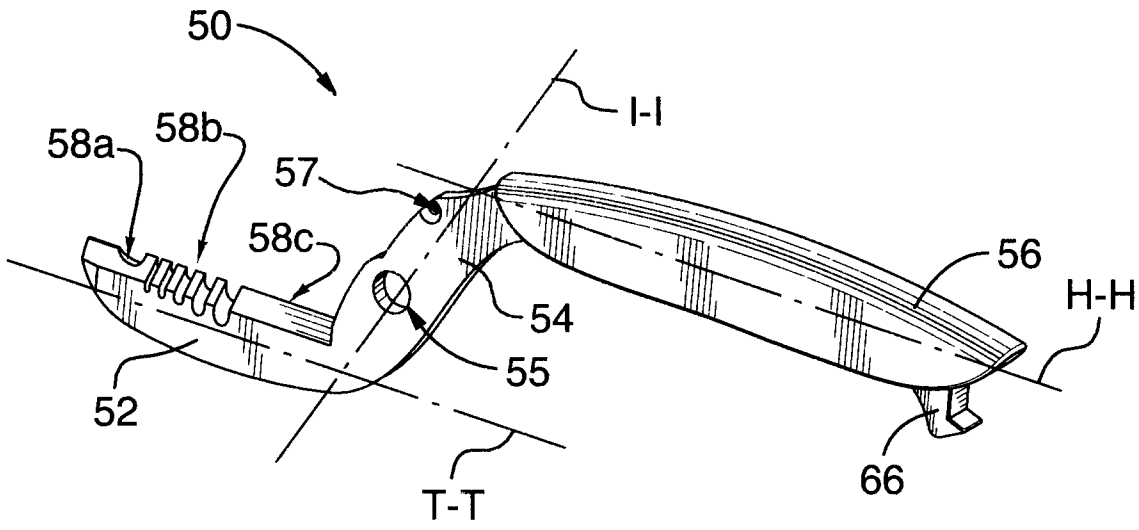

FIG.4

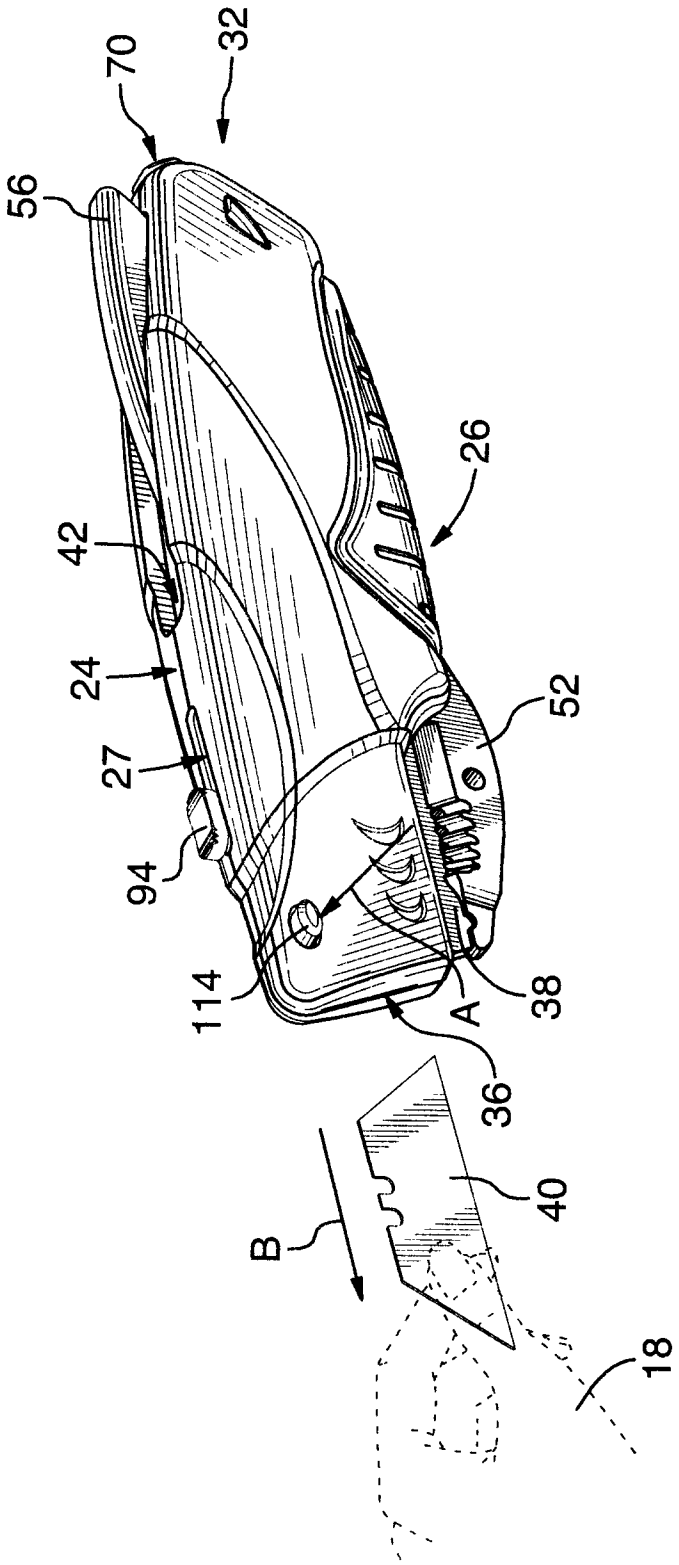

FIG.5

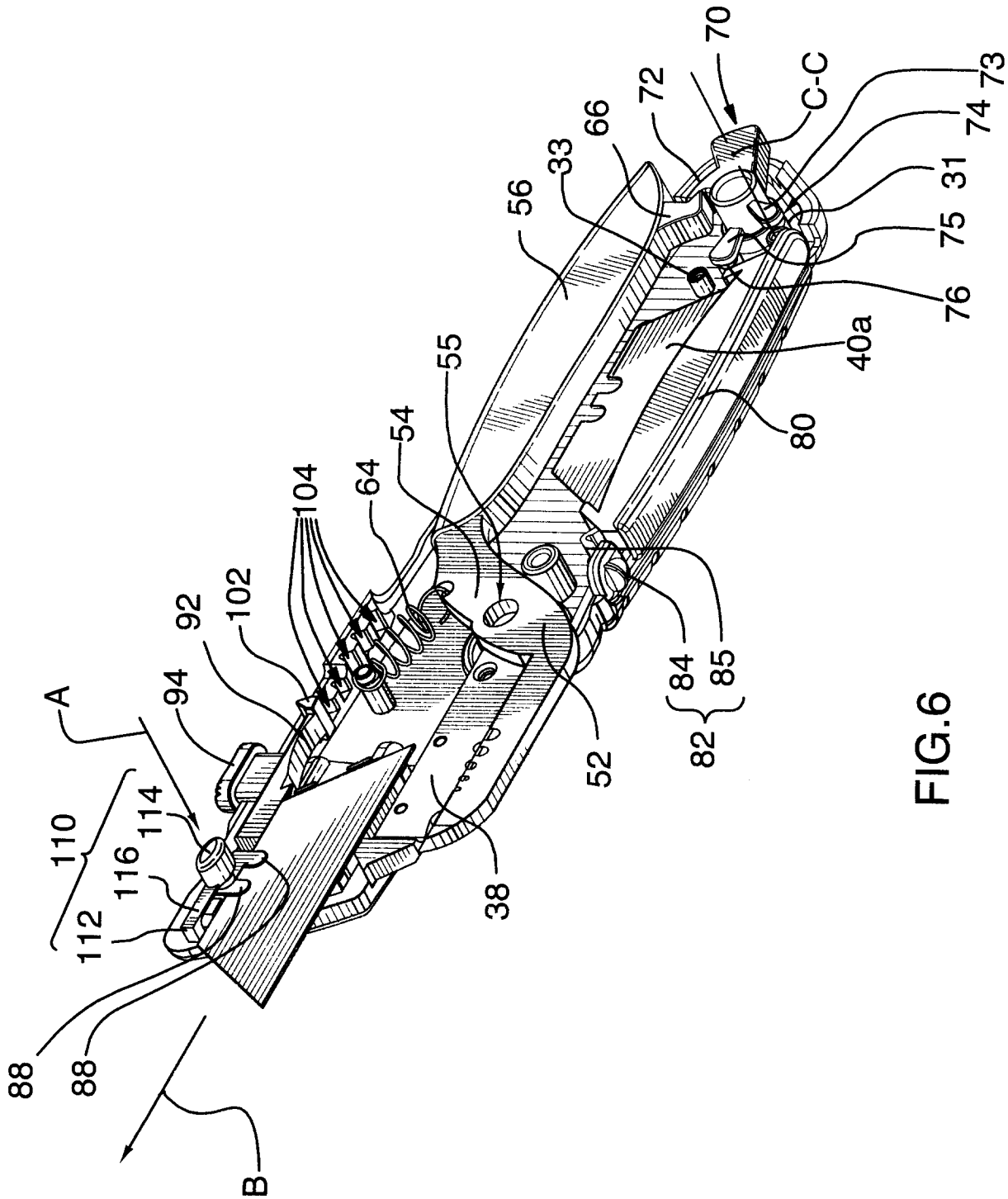
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FIG.6

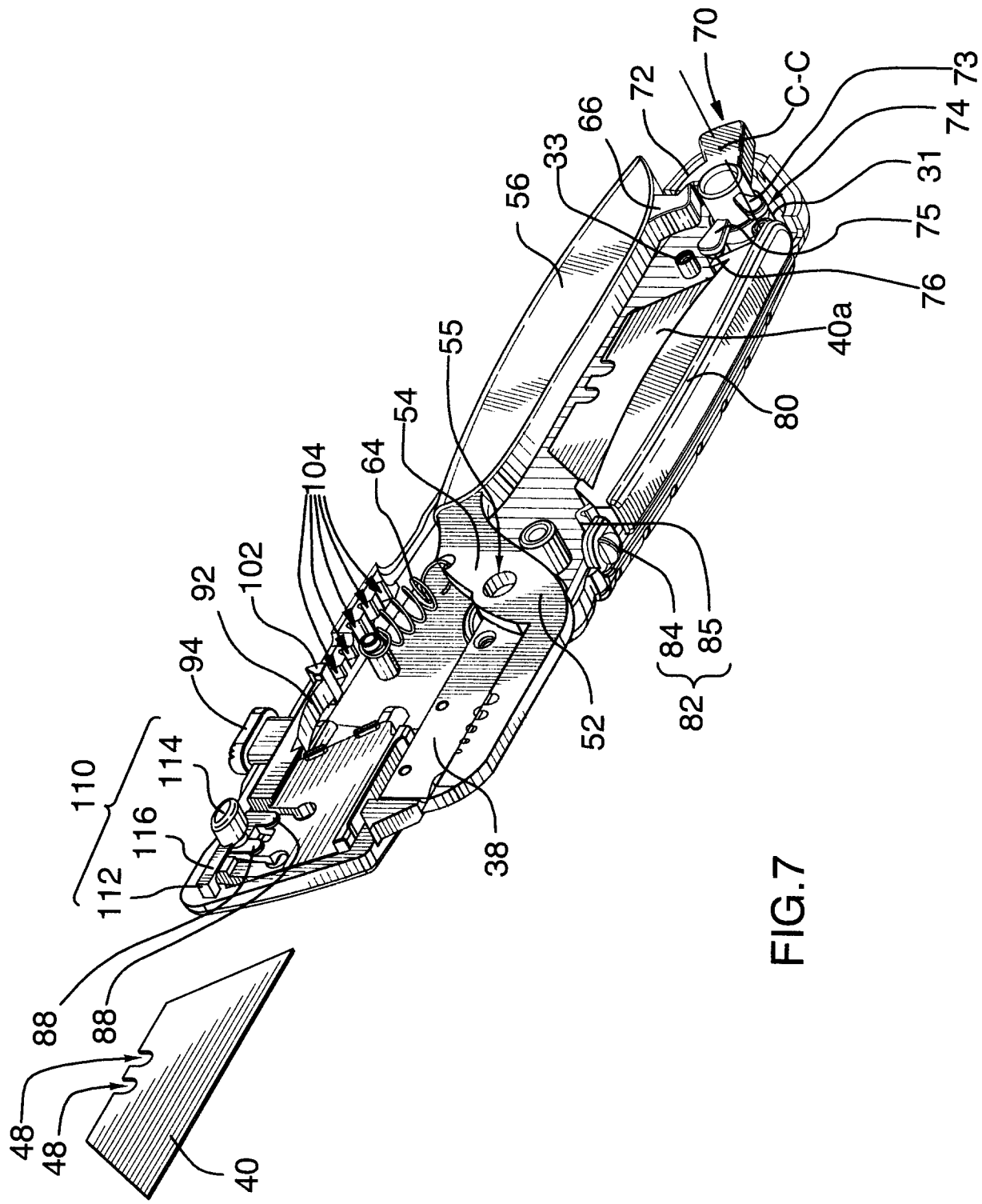
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FIG.7

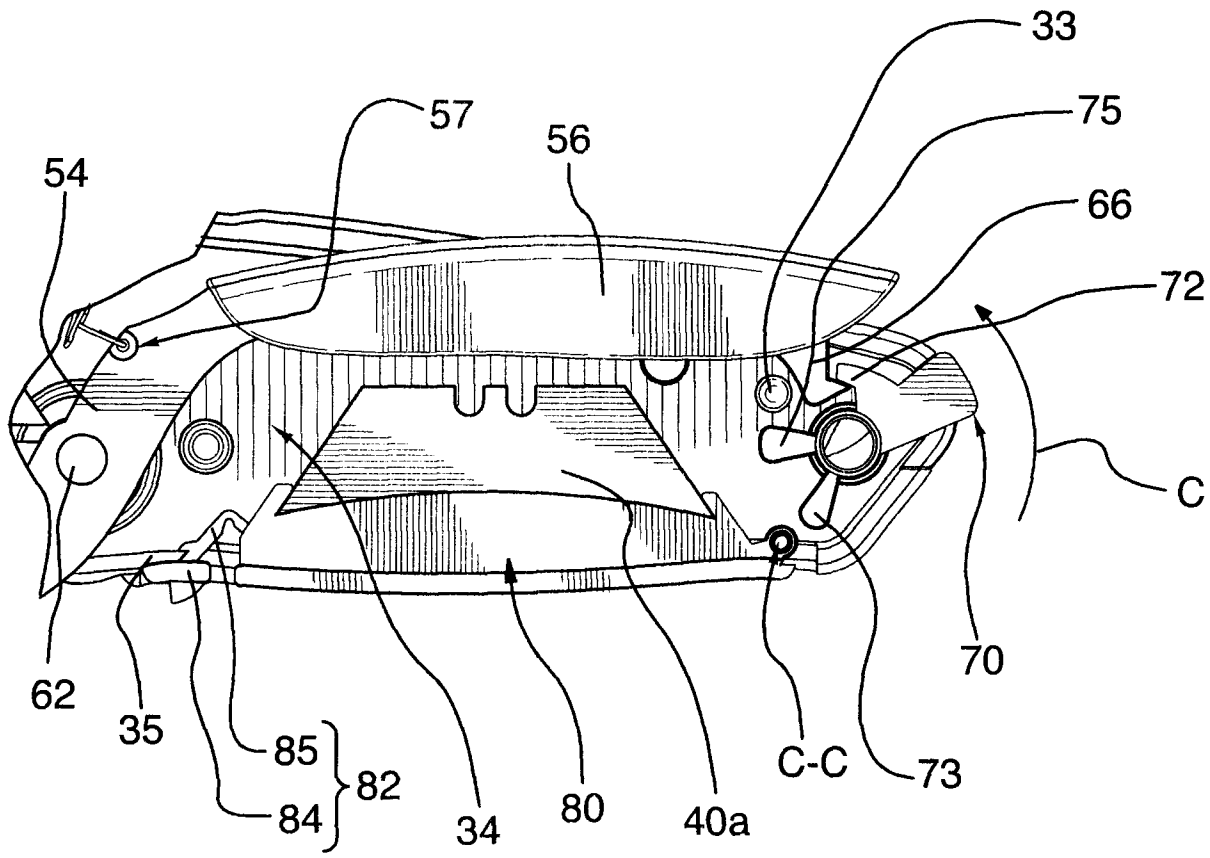

FIG.8

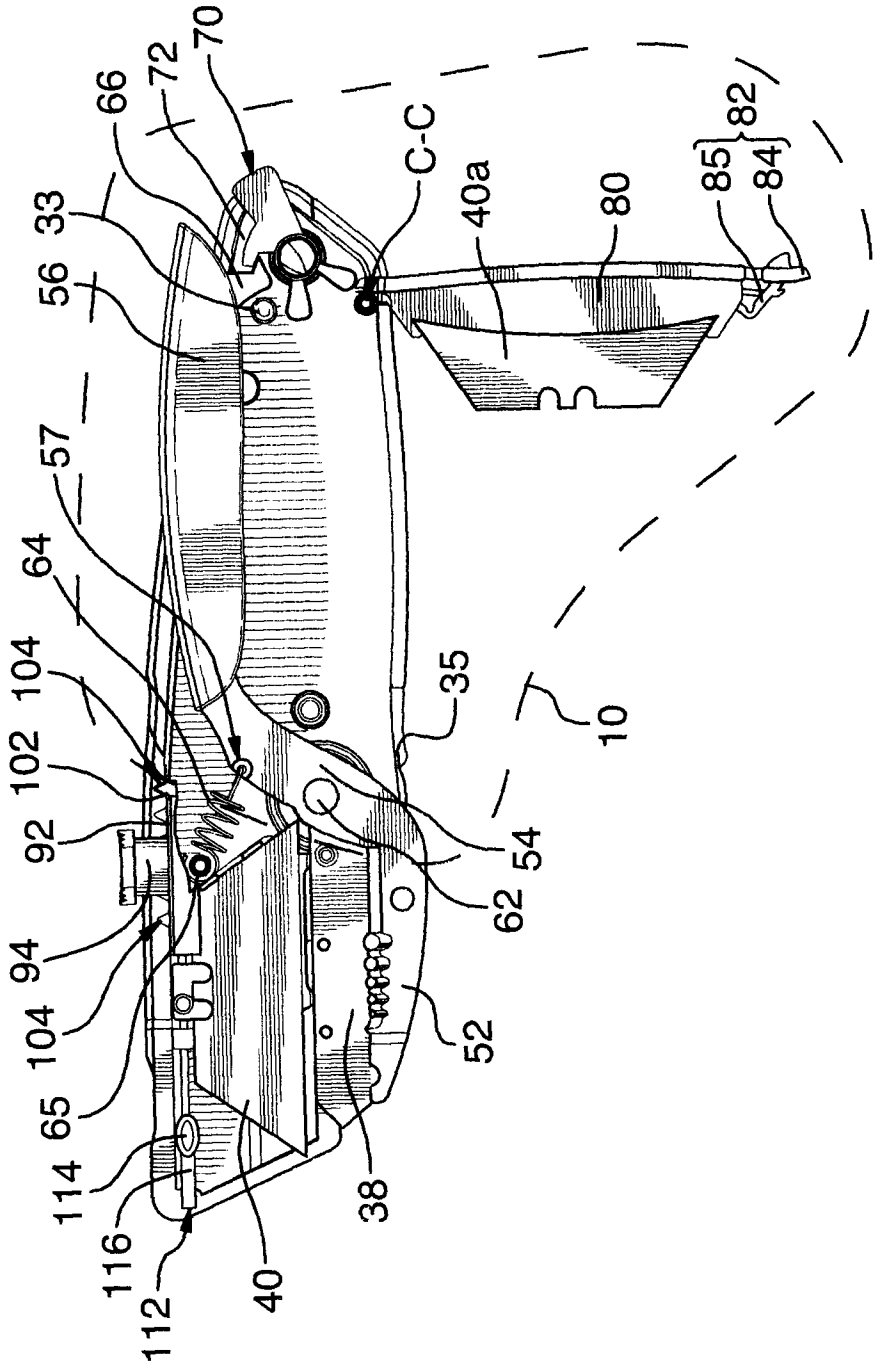
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FIG.9

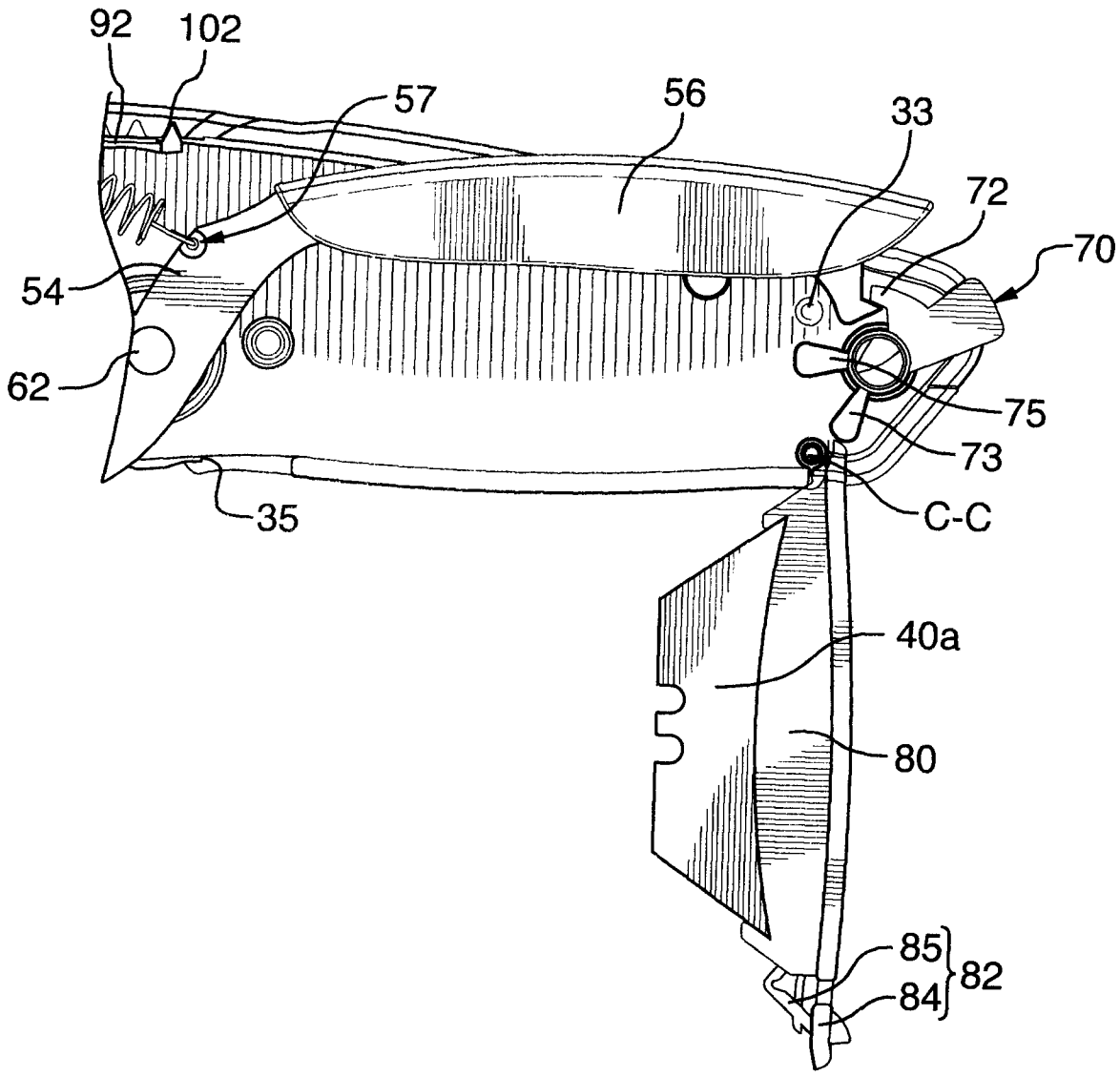

FIG.10

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA2008/000136

A. CLASSIFICATION OF SUBJECT MATTER
IPC: ***B26B 11/00*** (2006.01) , ***B25F 1/04*** (2006.01) , ***B26B 1/04*** (2006.01)
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC: B26B 1/*, 5/00, 11/00, 17/00, 17/02; B25F 1/*; B25B 7/*, 33/00
USPC: 7/*, 81/9.4, 9.51, 9.41, 9.43, 9.44

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic database(s) consulted during the international search (name of database(s) and, where practicable, search terms used)
Canadian Patents Database; Delphion; WEST
Keywords: lever, pivot, blade, jaw, handle, knife, multipurpose, pliers, wire, wire cutter, stripper, crimper, blade carrier

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 1,561,993 (NIELSEN) 17 November 1925 (17-11-1925) *the whole document*	1 to 25
A	US 6,318,218 B1 (ANDERSON ET AL.) 20 November 2001 (20-11-2001) Figures 21, 22, 21A, 21B	1 to 25
A	CA 2,500,489 A1 (HERNANDEZ ET AL.) 9 December 2004 (09-12-2004) Figure 4A; page 5, lines 34 and 35; page 9, lines 6 to 25	15 to 17, 23, 24

[ ] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
10 September 2008 (10-09-2008)	19 September 2008 (19-09-2008)

Name and mailing address of the ISA/CA	Authorized officer
Canadian Intellectual Property Office Place du Portage I, C114 - 1st Floor, Box PCT 50 Victoria Street Gatineau, Quebec K1A 0C9 Facsimile No.: 001-819-953-2476	Josee Pharand 819- 934-4262

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CA2008/000136

Patent Document Cited in Search Report	Publication Date	Patent Family Member(s)	Publication Date
US 1,561,993 A	17-11-1925	N/A	
US 6,318,218 B1	20-11-2001	AT 249319T	15-09-2003
		AU 6632800A	13-03-2001
		CN 1060425C	10-01-2001
		CN 1118355C	20-08-2003
		CN 1189116A	29-07-1998
		CN 1294957A	16-05-2001
		DE 69629872D1	16-10-2003
		DE 69629872T2	29-07-2004
		EP 0744251A2	27-11-1996
		EP 0744251A3	05-03-1997
		EP 0744251B1	10-09-2003
		EP 1114701A2	11-07-2001
		EP 1114701A3	27-02-2002
		US 5711194A	27-01-1998
		US 5794497A	18-08-1998
		US 5819612A	13-10-1998
		US 5868048A	09-02-1999
		US 5904080A	18-05-1999
		US 5927164A	27-07-1999
		US 6026717A	22-02-2000
		US 6026718A	22-02-2000
		US 6032557A	07-03-2000
		US 6047619A	11-04-2000
		US 6050158A	18-04-2000
		US 6060801A	09-05-2000
		US 6082232A	04-07-2000
		US 6085620A	11-07-2000
		US 6105474A	22-08-2000
		US 6109148A	29-08-2000
		US 6119560A	19-09-2000
		US 6119561A	19-09-2000
		US 6131222A	17-10-2000
		US 6181229B1	30-01-2001
		US 6182541B1	06-02-2001
		US 6209428B1	03-04-2001
		US 6257106B1	10-07-2001
		US 6260453B1	17-07-2001
		US 6286400B1	11-09-2001
		US 6298756B1	09-10-2001
		US 6305256B1	23-10-2001
		US 6356176B1	12-03-2002
		US 6374711B2	23-04-2002
		US 6499168B1	31-12-2002
		US 6655243B2	02-12-2003
		US 2001012754A1	09-08-2001
		US 2001029815A1	18-10-2001
		US 2002005095A1	17-01-2002
		US 2002035901A1	28-03-2002
		US 2002069729A1	13-06-2002
		US 2004065178A1	08-04-2004
		WO 0113383A1	22-02-2001
		WO 9637343A1	28-11-1996
CA 2,500,489 A1	09-12-2004	AU 2003228253A1	21-01-2005
		CN 1688419A	26-10-2005
		CN 100358687C	02-01-2008
		GB 0506576D0	04-05-2005
		GB 2408229B	20-09-2006
		US 7322110B2	29-01-2008
		US 2004237312A1	02-12-2004
		US 2007074402A1	05-04-2007
		WO 2004106012A1	09-12-2004