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(54) GUILLOTINE PROTECTION GUARD

(57) A cutting arm for a guillotine, said cutting arm having a free end and being pivotally mounted at an opposite end for effective cutting movement between a first configuration, in which said free end is fully raised, and a second configuration in which said free end is fully lowered, said cutting arm comprising an elongate cutting blade (4), a guard member (1) configured to extend along at least a portion of the length of an outer surface of said cutting blade (4) when said free end of said cutting arm is in said fully raised configuration, the cutting arm further comprising a guide mechanism (7, 5) that is configured to engage with said guard member (1) during said cutting movement, such that said lip of said guard member (1) is moved away from said cutting edge of said cutting arm to expose said cutting edge when said free end of said cutting arm is in said fully lowered configuration.

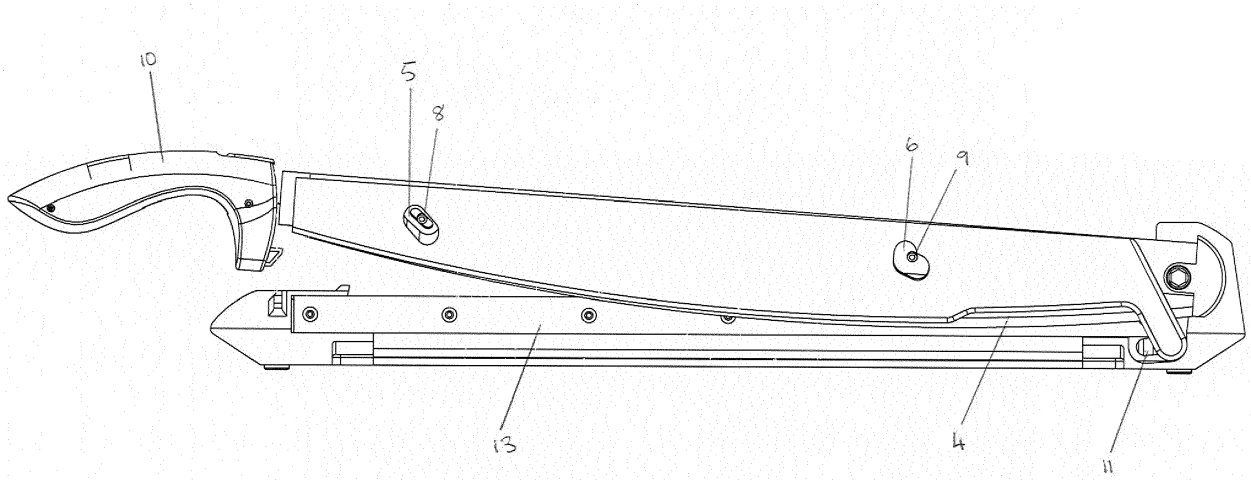

FIG. 6

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Description

[0001] This invention relates to a protective cover for a cutting blade for a tool such as a guillotine.

[0002] Many types of blade protection devices are known for tools such as guillotines for protecting the user from cutting themselves on the sharpened edge of the blade. One such known safety device provides a means of enclosing the blade within a protective outer casing such as a box, with an external lever for depression of the blade. There is a safety guard that must be fitted on to the guillotine in order to unlock the blade and enable cutting. However, such safety devices are cumbersome and difficult to move around or store.

[0003] Another such safety protection device consists of a safety guard that rotates around the cutting blade upon depression of said blade so that when the blade is raised, for example, when the blade is not in use, the sharpened edge of said blade is covered, protecting the user from harm. When the blade is depressed, however, the safety guard rotates around the cutting blade to expose the sharpened edge thereof. This safety guard not only taking up excess space, but also acts to block the user's line of view to the blade, and therefore, potentially decrease accuracy of the cut.

[0004] There are also known safety protection devices that provide a transparent guard plate parallel to the front face of the blade of a guillotine, spanning the entire lateral range of movement of the blade, such that the user cannot access the sharpened edge of the blade from the side of use. Once again, this can take up a lot of space and be relatively bulky for transport or storage of said device.

[0005] It would, therefore, be desirable to produce a guillotine with a space-efficient blade protection device that provides enhanced protection for the user whilst optimising visibility during use.

[0006] In accordance with an aspect of the present invention, there is provided cutting arm for a guillotine, said cutting arm having a free end and being pivotally mounted at an opposite end for effecting a cutting movement between a first configuration, in which said free end is fully raised, and a second configuration in which said free end is fully lowered, said cutting arm comprising an elongate cutting blade, a guard member configured to extend along at least a portion of the length of an outer surface of said cutting blade and comprising a lip portion configured to extend over a cutting edge of said cutting blade when said free end of said cutting arm is in said fully raised configuration, the cutting arm further comprising a guide mechanism that is configured to engage with said guard member during said cutting movement, such that said lip of said guard member is moved away from said cutting edge of said cutting arm to expose said cutting edge when said free end of said cutting arm is in said fully lowered configuration.

[0007] The guard member may comprise a free end with a mounting pin at or adjacent to the opposite end at a location proximal to the pivot point of said cutting arm, and said mounting pin is receivable within a linear channel in or on said guillotine, for sliding relative movement of the pin therein such that linear movement of said guard member relative to said cutting blade is permitted, in use.

[0008] In an exemplary embodiment of the invention, the guard member may be composed of a resiliently flexible material, and said guide mechanism is configured to engage with said guard member during said cutting movement such that the guard member flexes in a substantially lateral direction relative to said outer surface of said cutting blade to expose said cutting edge when said free end of said cutting arm is in said fully lowered configuration. According to another exemplary embodiment, the guard member may comprise a profiled lower surface and said guard member may be configured to progressively engage with a guide member during a cutting movement, such that said guide member may exert a corresponding lateral force on said guard member, causing it to move diagonally upward relative to said cutting blade, thereby to cause said lip to become offset from the cutting edge of said cutting blade and exposing said cutting edge.

[0009] The guard member may be formed of a resiliently flexible material and may be configured such that, as the cutting arm is returned toward said fully raised configuration, and said guard member becomes disengaged from said guide member, said guard member may return to a lowered configuration in which said lip portion thereof extends over said cutting edge of said cutting blade.

[0010] According to another exemplary embodiment of the invention, the guide mechanism may be a guard guide connected to said guard member.

[0011] In a further exemplary embodiment of the invention, the cutting arm may comprise a mounting cover for mounting said cutting arm components, wherein said mounting cover may be composed of a substantially rigid material.

[0012] The cutting blade and guard guide described above may be mounted within the mounting cover, with said guard member being mounted on an external face thereof. The guard member may be mounted on the external face of said mounting cover by at least two pins extending from the surface of the guard guide, said at least two pins being received within at least two corresponding apertures in the mounting cover and further through at least two respective corresponding apertures in the guard.

[0013] Each of the pins described above may be configured to move relative to the guard, within the constraints of their corresponding apertures, such that movement of the blade relative to the guard is permitted.

[0014] At least one of the apertures in the guard may be able to engage with a respective pin therein to further reveal said cutting edge of said blade.

[0015] Aspects of the present invention extend to a guillotine including a cutting arm substantially as de-

scribed above.

[0016] These and other aspects of the present invention will become apparent from the following specific description, in which embodiments of the present invention are described, by way of examples only, and with reference to the accompanying drawings, in which:

Figure 1 is an exploded perspective view of a blade guard according to an exemplary embodiment of the invention;

Figure 2 is a schematic front perspective view of a guillotine, in its fully assembled configuration, incorporating the blade guard of Figure 1;

Figure 3 is a schematic rear perspective view of the guillotine of Figure 2, incorporating the blade guard of Figure 1;

Figure 4 is a schematic front view of the guillotine of Figure 2, incorporating the blade guard of Figure 1, when the blade is in its exposed configuration;

Figure 5 is a schematic front view of the guillotine of Figure 2, incorporating the blade guard of Figure 1, when the blade is in its secure configuration;

Figure 6 is a schematic front view of the guillotine of Figure 2, incorporating the blade guard of Figure 1, when the blade is in an intermediate configuration;

Figure 7 is a schematic front view of the guillotine of Figure 2, incorporating the blade guard of Figure 1, when the blade is in a further intermediate configuration;

[0017] Referring to Figure 1 of the drawings, a blade guard comprises a flexible guard 1, a guard guide 2, and a rigid mounting cover 3. Each of these elements fits together to form a blade guard that can be mounted onto a blade 4 to form a protective cover over the front face of said blade 4. In its assembled configuration, the blade guard together with the blade 4 comprise the cutting arm of the guillotine, whereby the uppermost extended portion of the rear face of the blade 4 is secured to an internal extended face of the mounting cover 3 and the front face of the blade 4 is affixed to a guard guide 2, the guard guide 2 being further affixed to the opposing internal extended face of the mounting cover 3, with all three components pivotally mounted to the guillotine at the fixed end of the cutting arm at a pivot point 12. The guard 1 is mounted onto the guillotine at a second, separate point 14, wherein the guard 1 comprises a mounting pin 7 which extends into a linear slot 11 in the main body of the guillotine. The slot 11 is a substantially rectangular aperture in the base portion13 of the guillotine, with a right-handed, diagonal orientation relative to the rest of the base portion 13 of the guillotine. There are two spaced apart substantially cylindrical pins, 8 and 9, extending from the front face of the guard guide 2 through two corresponding apertures in the mounting cover 3, and further through two corresponding apertures, slots 5 and 6, in the guard 1, connecting the guard 1 to the rest of the blade guard components. Slot 5 is a substantially rectangular opening in guard 1, with a left-handed diagonal orientation relative to the rest of the guard 1. Slot 5 can engage with the guard guide 2 to further reveal the blade 4 when a certain angle of depression of the blade 4 is reached. Slot 6 is a right-handed, substantially L-shaped opening configured to interact with the pin 9.

[0018] Referring to Figure 5 of the drawings, a handle 10 is attached to the free end of the blade 4 for upward and downward operation thereof. The fixed end of the blade 4 is, as mentioned above, affixed to the main body of the guillotine at a pivot point 12, along with the guard guide 2 and the mounting cover 3. When the blade 4 is in its secure configuration, the handle 10 is raised, elevating the free end of the blade 4 relative to the fixed end of the blade 4 at pivot point 12. The guard 1 substantially covers the exposed section of the front face of the blade 4, extending substantially parallel to the blade 4, with a profiled lip at its lowermost edge extending horizontally to further cover a portion of the sharpened edge of the blade 4, thus shielding the blade 4, and protecting the user from harm. When the blade 4 is in its secure configuration, the uppermost edge of the guard 1 is lowered and the free edge of the guard 1 is shifted to the right relative to the uppermost edge and free edge of mounting cover 3. The profiled lip of the guard 1 is configured so as to cover the sharpened edge of the blade 4 at the free end, extending to further cover around 80% of the sharpened edge of the blade 4, leaving only the fixed end of the sharpened edge of the blade 4 proximal to the pivot point 12 uncovered. The pins 8 and 9 extend through their corresponding apertures, 5 and 6, such that each of the pins are positioned at the top of their respective apertures. The pin 7 is positioned at the bottom left-hand corner of the slot 11.

[0019] Referring to Figure 4 of the drawings, when the blade 4 is in its revealed configuration, the handle 10 is fully depressed, such that the free end of the blade 4 is in a lowered position. The uppermost edge and the free edge of the blade guard 1 are substantially level with the corresponding uppermost edge and free edge of the mounting cover 3, such that the profiled lip of the guard 1 is moved away from the sharpened edge of the blade 4. Therefore the sharpened edge of the blade 4 is exposed, enabling the guillotine to cut the desired material. The level position of the guard 1 relative to the mounting cover 3, and hence the guard guide 2, means that the pins 8 and 9 extend through their corresponding apertures, 5 and 6, such that pin 8 is positioned at the bottom of slot 5, which is engaged, and pin 9 is positioned at the upper edge of the lower portion of slot 6. The pin 7 is now positioned at the top of the slot 11.

[0020] It may be noted that the position of the guard 1 changes relative to the blade 4 depending on the position of the handle 10, and therefore, the angle of rotation of the blade 4 about the pivot point 12.

[0021] Referring to Figure 7 of the drawings, upon initial depression of the handle 10 from the secure configuration, the blade 4 is in a first intermediate configuration,

whereby depression of the blade 4 forces the pin 7 to move laterally within the slot 11 until it reaches the top right-hand corner of the slot 11. At the fixed end of the cutting arm, the guard 1 has moved upward relative to the blade 4 such that the uppermost edge of the guard 1 is almost level with the uppermost edge of the mounting cover 3. At the free end of the cutting arm, the uppermost edge of the guard 1 is lowered and the free edge is shifted to the right relative to the uppermost edge and free edge of mounting cover 3. The blade 4 is not hindered by the guard 1 as only the uncovered portion of the sharpened edge of the blade 4 proximal to the pivot point 12 has made contact with the base portion 13, hence starting the cut in the desired material. Both pin 8 and pin 9 are maintained at the top of the respective slots, 5 and 6, in which they reside.

[0022] Referring to Figure 6 of the drawings, upon further depression of the handle 10 from the first intermediate configuration described above, the blade 4 is in a second intermediate configuration, whereby pin 7 is maintained at the top right-hand corner of slot 1. Therefore, the pin 7 cannot move any further upwards, with further depression of the blade 4 creating tension across the guard 1, and engaging slot 5. The engagement of slot 5 fixes the position of the guard 1, enabling the pin 9 to travel downwards along the diagonal slope of the slot 5, such that the mounting cover 3, and hence the blade 4 moves downward relative to the guard 1. It is this engagement of slot 5 that increases the tension across the guard 1 to a point at which the guard 1 is forced to slide up the diagonal face of the mounting cover 3, such that the guard 1 starts to travel upwardly and leftwardly relative to the mounting cover 3. The relative leftward movement of the guard 1 causes the profiled edge of the lip to clear the sharpened edge of the blade 4, whilst the relative upward movement of the guard 1 enables the blade 4 to be downwardly depressed without the guard 1 colliding with the base portion 13 of the guillotine. This exposure of the sharpened edge of the blade 4 allows completion of the cut of the desired material. Pin 9 is positioned at the uppermost central corner of the generally L-shaped slot 6 in which it resides.

[0023] It is important to note that this process of lowering of the blade 4 and subsequent revealing of the blade 4 is a smooth process and there are a continuous range of intermediate configurations, with the two outlined above being examples of such motion.

[0024] It will be apparent to a person skilled in the art, from the foregoing description, that modifications and variations can be made to the described embodiments without departing from the scope of the invention as defined in the appended claims.

Claims

1. A cutting arm for a guillotine, said cutting arm having a free end and being pivotally mounted at an opposite end for effecting a cutting movement between a first configuration, in which said free end is fully raised, and a second configuration in which said free end is fully lowered, said cutting arm comprising an elongate cutting blade, a guard member configured to extend along at least a portion of the length of an outer surface of said cutting blade and comprising a lip portion configured to extend over a cutting edge of said cutting blade when said free end of said cutting arm is in said fully raised configuration, the cutting arm further comprising a guide mechanism that is configured to engage with said guard member during said cutting movement, such that said lip of said guard member is moved away from said cutting edge of said cutting arm to expose said cutting edge when said free end of said cutting arm is in said fully lowered configuration.

2. A cutting arm according to claim 1, wherein said guard member comprises a free end and a mounting pin at or adjacent to the opposite end at a location proximal to the pivot point of the cutting arm, and wherein said guide mechanism includes a linear channel within which said mounting pin is received for sliding relative movement of the pin therein such that linear movement of said guard member relative to said cutting blade is permitted.

3. A cutting arm according to claim 1 or claim 2, wherein said guard member is composed of a resiliently flexible material and said guard member is configured to engage with said guide mechanism during said cutting movement such that the guard member is caused to flex in a substantially lateral direction relative to said outer surface of said cutting blade to expose said cutting edge as said free end of said cutting arm approaches said fully lowered configuration.

4. A cutting arm according to claim 3, wherein said guard member comprises a profiled lower surface configured to progressively engage with a guide member during a cutting movement, such that said guide member exerts a corresponding lateral force on said guard member, causing it to flex outwardly relative to said cutting blade, thereby to cause said lip to become offset from the cutting edge of said cutting blade and exposing said cutting edge.

5. A cutting arm according to claim 4, wherein said guard member is formed of a resiliently flexible material and configured such that, as the cutting arm is returned toward said fully raised configuration, and said guard member becomes disengaged from said guard member, said guard member returns to a non-flexed configuration in which said lip portion thereof extends over said cutting edge of said cutting blade.

6. A cutting arm according to any of the preceding claims, wherein said guide mechanism is a guard guide connected to said guard member.

7. A cutting arm according to any of the preceding claims, wherein said cutting arm comprises a mounting cover for mounting said cutting arm components.

8. A cutting arm according to claim 7, wherein said mounting cover is composed of a substantially rigid material.

9. A cutting arm according to any one of claims 4 to 8, wherein said blade member and said guard guide are mounted within said mounting cover, with said guard being mounted on an external face thereof.

10. A cutting arm according to claim 9, wherein said guard is mounted on the external face of said mounting cover by at least two pins extending from the surface of the guard guide, said at least two pins being received within at least two corresponding apertures in the mounting cover and at least two respective corresponding apertures in the guard.

11. A cutting arm according to claim 10, whereby said pins are configured to move relative to said guard, within the constraints of their corresponding apertures, such that movement of said blade relative to said guard is permitted.

12. A cutting arm according to claim 11, whereby at least one of said apertures in said guard is configured to engage with a respective pin therein to further reveal said cutting edge of said blade.

13. A guillotine including a cutting arm according to any of the preceding claims.

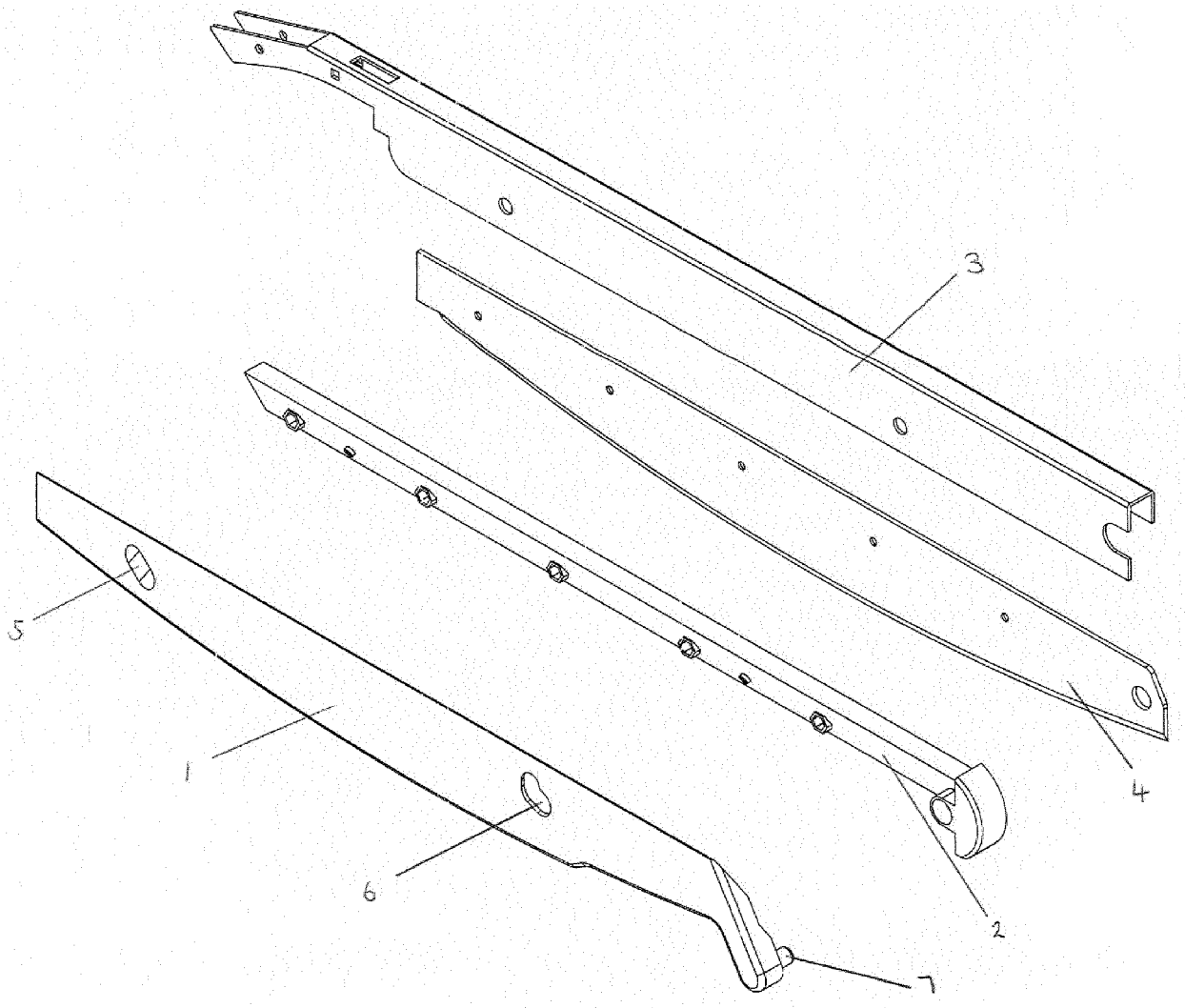

FIG. 1

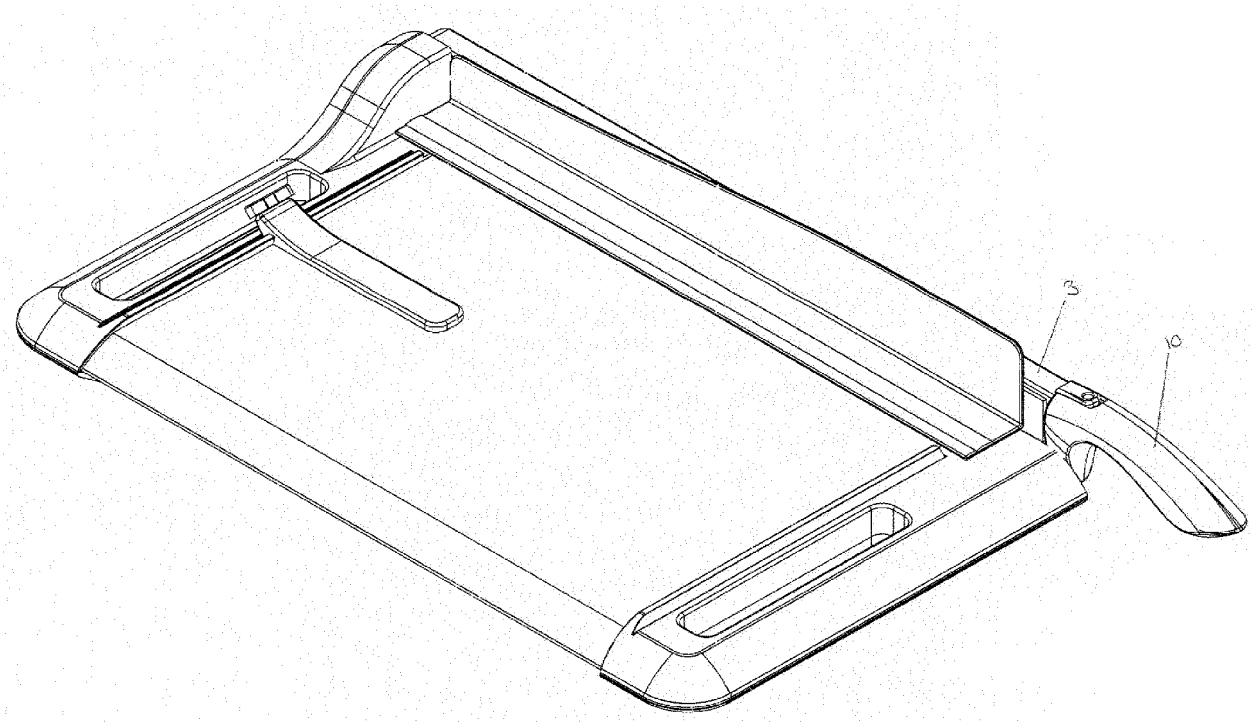

FIG. 2

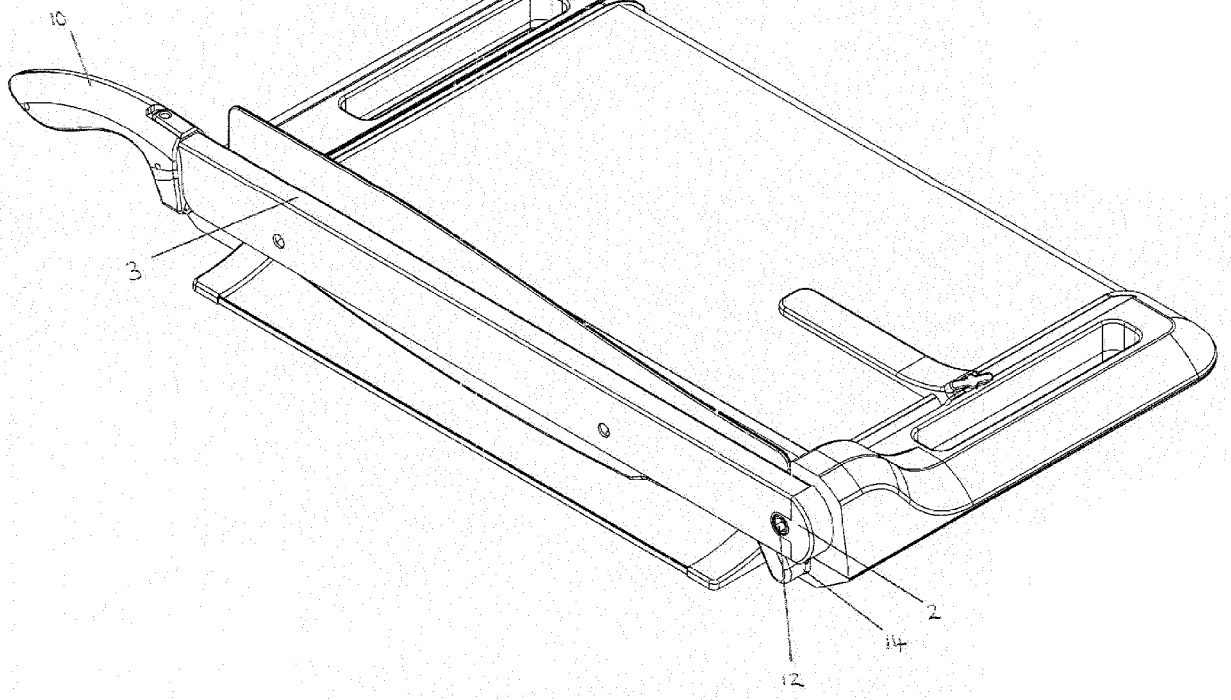

FIG.3

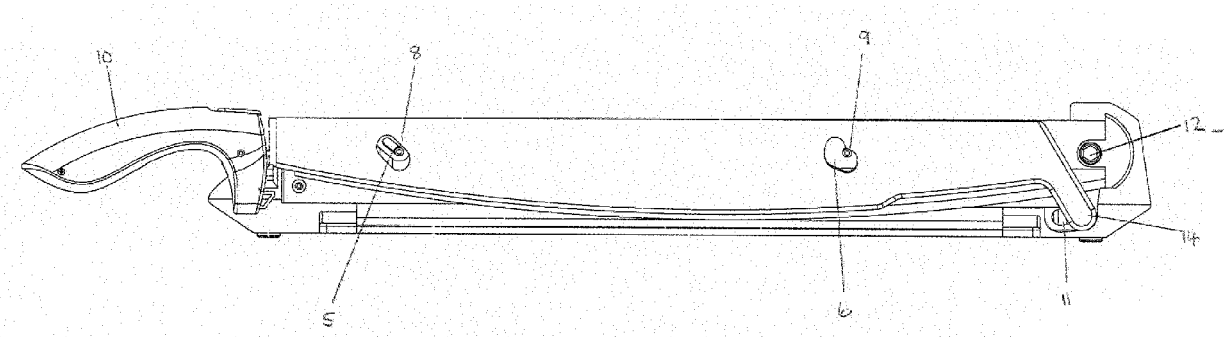

FIG. 4

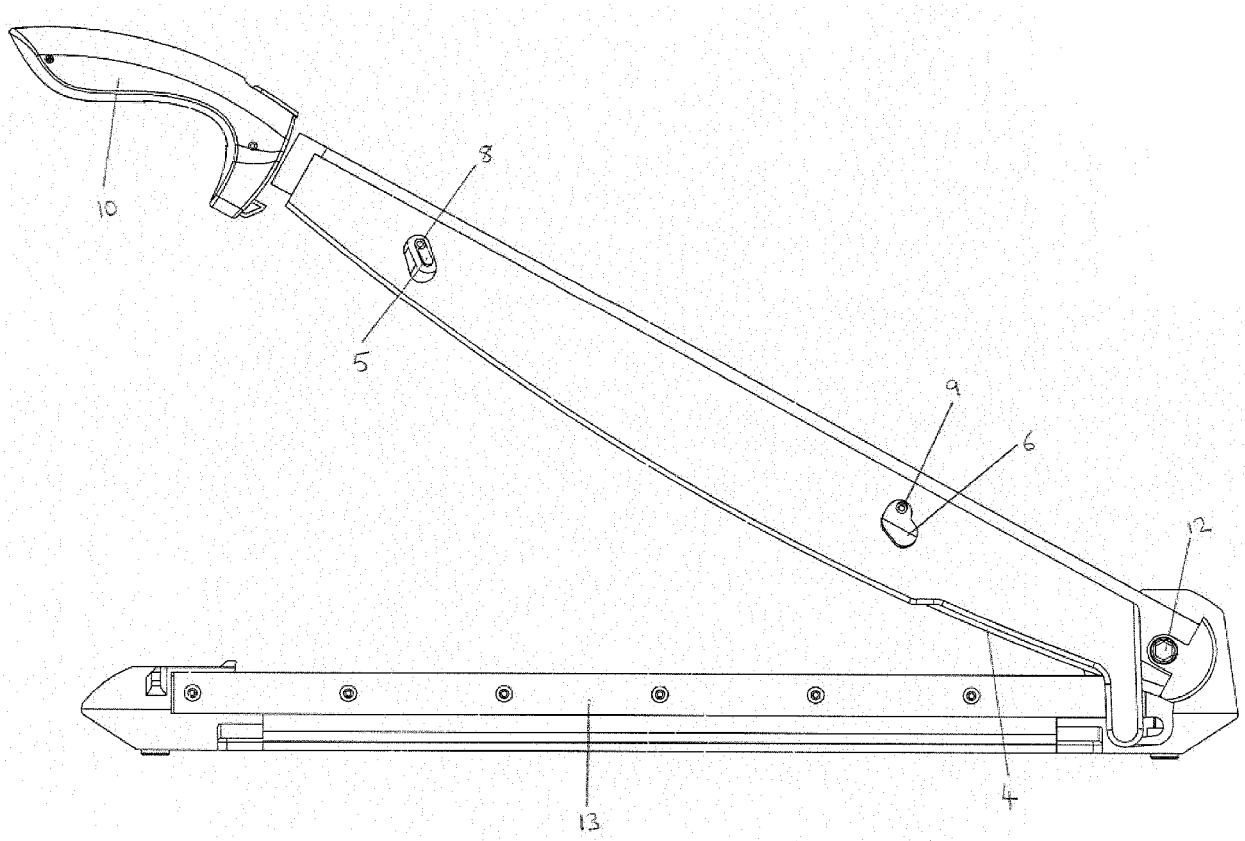

FIG. 5

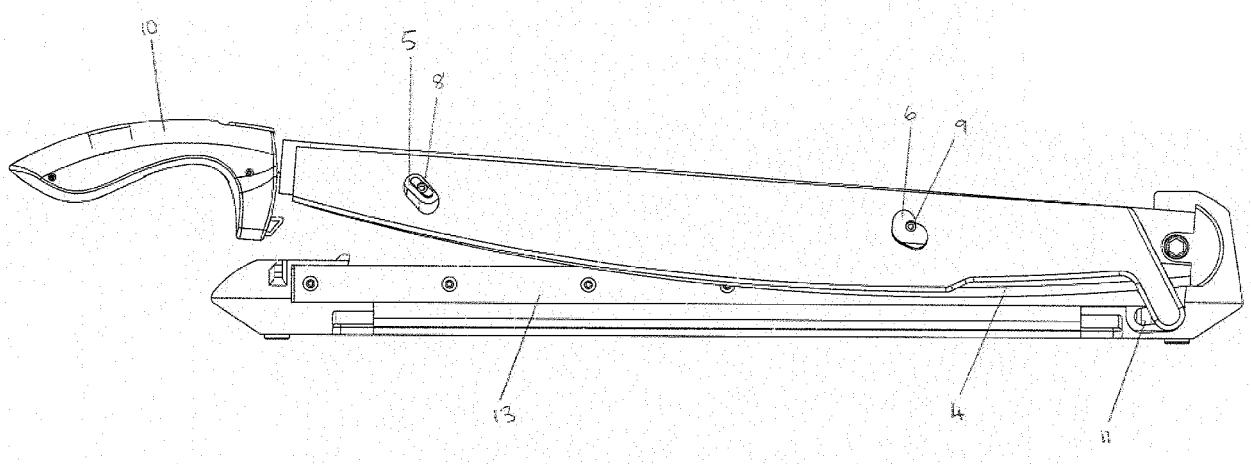

FIG. 6

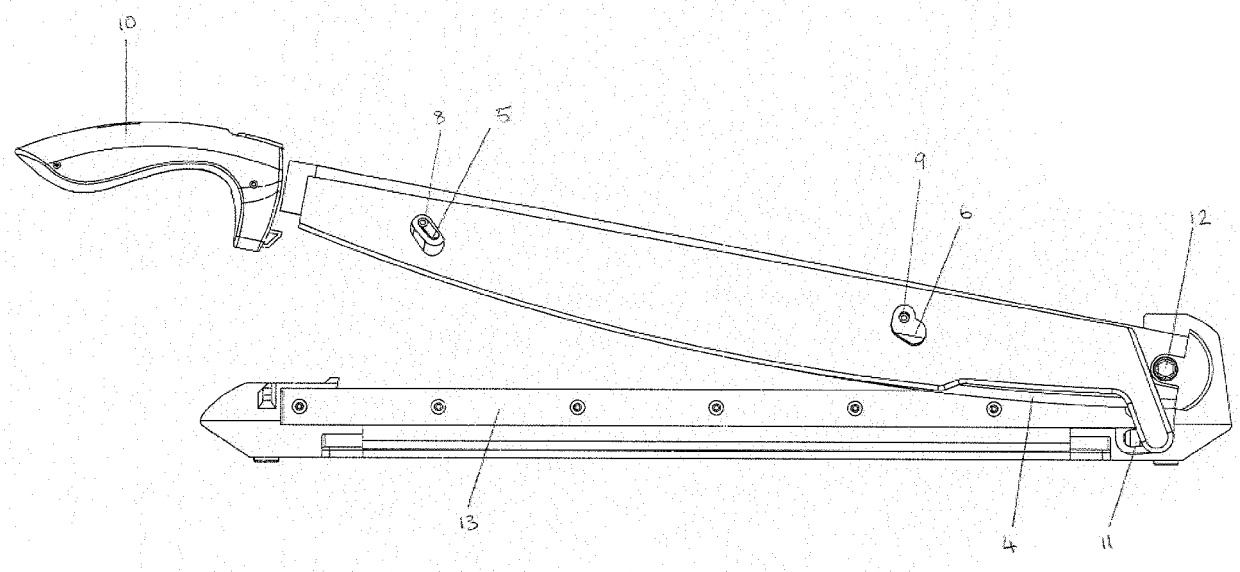

FIG. 7

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EUROPEAN SEARCH REPORT

Application Number
EP 16 17 0927

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 10 2010 060728 A1 (CHIANG TUNG-LUNG [TW]) 24 May 2012 (2012-05-24)	1,6-13	INV.
A	* the whole document *	2-5	B26D1/30
	---		B26D7/00
			B26D7/22
X	DE 25 27 384 B1 (HANSA TECHNIK GMBH FA) 23 December 1976 (1976-12-23)	1	
	* figures *		

TECHNICAL FIELDS SEARCHED (IPC)

B26D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	20 October 2016	Canelas, Rui

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 102010060728 A1	24-05-2012	NONE	
DE 2527384 B1	23-12-1976	NONE	

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