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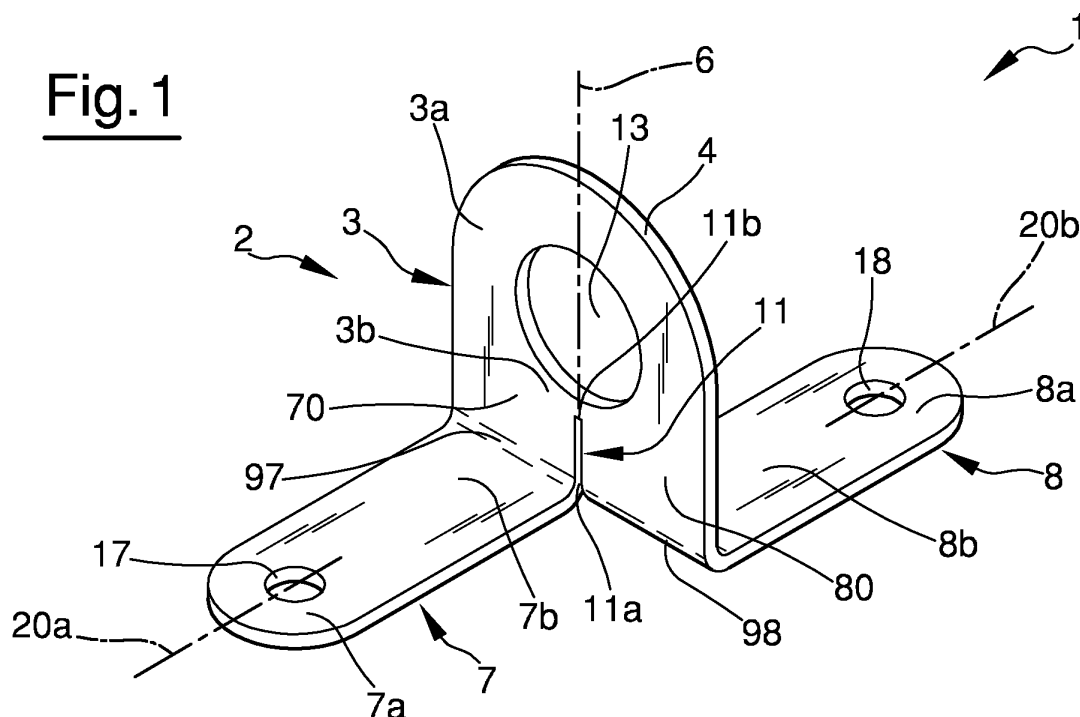
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(54) **Fall protection anchoring device**

(57) A fall protection anchoring device (1) comprising a main body (2) having an anchoring portion (3) having a thickness (4) and developing, along a direction of development (6), at least partially in a reference plane and intended to be anchored, on a first end (3a) thereof, to a personal protection device worn by an operator, the main body (2) further having at least a first and a second fastening portion (7, 8) intended to be fastened to the fixed structure of the building and arranged in two opposed

half-spaces with respect to the reference plane, the anchoring portion (3) comprising in correspondence of a second end (3b) thereof a notch (11) through the thickness (4) and apt to divide, along a separation line corresponding to the notch itself, the second end (3b) into two sub-portions (70, 80), the first and second fastening portion (7, 8) being integral with the two sub-portions (70, 80), respectively, and developing from a respective end segment (97, 98) of the two sub-portions.

Fig. 1



Description

[0001] The present invention relates to a fall protection anchoring device, in particular for building roofs, and to a related fall protection anchoring system and method. The present invention applies to the field of safety systems for buildings.

[0002] In particular, the invention relates to a fall protection anchoring device, which can be of wall-type, i.e. intended to be fastened to a wall or in general to fixed structure of a building, or intended to be fastened to a roof, typically to a supporting structure of the roof, e.g. at least partially under a roof covering element.

[0003] As is known, there are specific regulations and requirements about safety in work environments, which require the use of suitable personal protective equipment and the compliance with correct behaviors in order to preserve the physical integrity of workers operating in conditions involving risks or dangers to their health.

[0004] With reference to the technical field involving the construction of roofs or coverings for buildings as well as the construction of technical systems, eaves gutters, flues or skylights, and the related checking, repair and maintenance steps, it is necessary to use equipment for the protection of falls from height, commonly referred to as fall protection devices, such as safety harnesses, hooking slings, retaining ropes, winders for safety cables.

[0005] The use of such equipment for enabling work under safety conditions requires manufactured items referred to as anchoring devices, permanently fastened to the roof or to fixed structures of the building and typically located thereon in different points, so as to create safety conditions anywhere on the structure, starting from the access area up to the farthest point. The operator anchors to this equipment the safety cable (typically provided with a winder), or another suitable device, connected to his/her harness, so as to work in full safety.

[0006] It is known about devices made up of a metal plate, typically rectangular or square in shape, fixedly fastened to a supporting structure of the roof or to a wall of the building, e.g. by means of a mechanical anchoring system (e.g. plugs or screws), and having a portion, typically welded to the plate or made as one piece with it, protruding from the plate and provided with a slot or through hole suitable shaped and accessible by the operator, to which the winder carried by the operator can be connected by means of a snap hook or similar element.

[0007] Typically, when the device is installed under a covering, only the protruding portion projects from the covering, e.g. between two adjacent covering element or between a suitable opening in the covering, whereas the plate connected to a fixed structure of the roof remains below the covering.

[0008] Patent document AU 697 769 B2 describes an energy absorber with a weakening line intended to be hooked to a static line so as to be part of the latter.

[0009] Although known anchoring devices enable to

hook suitable safety equipment, the Applicant has found that they are affected by some drawbacks and can be improved under various aspects, mainly concerning their behavior in response to the stresses they are subjected to as a result of a fall of the operator fastened thereto or in general as a result of strong stresses.

[0010] In particular, when the operator fastened to the anchoring device unintentionally loses his/her support on the roof or building part on which s/he is working, s/he falls from a certain height and typically stops when reaching a distance from the anchoring point corresponding to the length of the safety line, or of a similar device, used by the operator. This stop typically occurs instantaneously and the whole kinetic energy built up during the fall (due to the operator's weight and speed) is impulsively discharged onto the structure and the mechanical anchoring of the anchoring device, e.g. in the form of a tensile stress. In particular, the Applicant has found that due to the high structural stiffness of known devices this stress can cause the breaking of the device or the release thereof from the supporting structure to which it is fastened (as a result of the failure of the mechanical anchoring used for fastening).

[0011] The Applicant believes that known devices, e.g. due to their stiffness, exert on the operator a strong impulsive stress during the aforesaid fall end, with possible consequences on the operator's physical integrity.

[0012] It should be pointed out that known devices are typically characterized by a large overall size and/or by large dimensions and/or thicknesses of the structural elements (e.g. the aforesaid plate and/or protruding portion and the welding thereof, if any), required for increasing the resistance thereof to the aforesaid stresses and to prevent breaks or failures of the device. Typically, also mechanical anchorings used for fastening are large in size for the aforesaid reasons.

[0013] Under these circumstances, the technical task underlying the present invention is to provide a fall protection anchoring device and system which can obviate one or more of the drawbacks referred to.

[0014] Within this technical task, one of the aims of the present invention in one or more of its various aspects is to carry out a fall protection anchoring device and system which can resist the impulsive stress caused by an operator fastened thereto falling, without such fall leading to breaks of the device structure and/or the partial or total release of the device from the fixed structure of the building to which it is fastened.

[0015] One of the possible aims of the present invention in one or more of its various aspects is to provide a fall protection anchoring device characterized by a small thickness and/or overall size and/or by less material used for carrying it out.

[0016] One of the possible aims of the present invention in one or more of its various aspects is to provide a fall protection anchoring device which requires a smaller number of, and/or of smaller size, fastening means to a fixed structure of a device (e.g. a mechanical anchoring).

[0017] By way of example, the Applicant has realized that the present invention can allow to reduce the thickness of the device from 10 mm to 4 mm and/or to use for the fastening to the fixed structure of a building screws with a diameter of 10 mm instead of 14 mm, though keeping the tearing and/or breaking strength unchanged with respect to known devices.

[0018] A further possible aim of the present invention in one or more of its various aspects is to provide a fall protection anchoring device, system and method which are more reliable and/or ensure a higher level of safety for an operator anchored to the device and working on a building roof.

[0019] Another possible aim of the present invention in one or more of its various aspects is to provide a fall protection anchoring device and system which are simple and/or cheap as far as engineering and/or manufacturing and/or installation and/or configuration and/or operation and/or maintenance and/or storage and/or transport and/or disposal are concerned.

[0020] One or more of the above aims, and other possible aims which shall be more evident from the following description, are substantially achieved by a fall protection anchoring device, a fall protection anchoring system comprising this device and a fall protection safety method, according to one or more of the appended claims, each of them being considered alone (without its dependent claims) or in any combination with the other claims, as well as according to the following aspects, variously combined, also with the aforesaid claims.

[0021] In one aspect, the invention relates to a fall protection anchoring device apt to enable an operator to work safely on a roof or other fixed structure of a building, comprising a main body having an anchoring portion having a thickness and developing along a direction of development at least partially (preferably substantially and still more preferably totally) in a reference plane and intended to be anchored on a first end thereof to a personal protection device worn by the operator, said main body further having at least a first fastening portion and a second fastening portion, intended to be fastened on a respective first end thereof to the fixed structure of the building, and integral, in correspondence of a respective second end thereof, opposed to said first end, with said anchoring portion, said first and second fastening portion being arranged in two opposed half-spaces with respect to said reference plane and lying at least partially (preferably substantially and still more preferably totally) on a respective support plane, at least one of which (typically both) being transversal (i.e. not parallel, typically orthogonal) to said reference plane, said anchoring portion comprising in correspondence of a second end thereof, opposed to said first end, a notch through said thickness and apt to divide along a separation line corresponding to said notch said second end of the anchoring portion into two sub-portions, said first fastening portion and second fastening portion being integral with said two sub-portions, respectively, and developing from a respective

end segment of said two sub-portions.

[0022] In one aspect, said main body can undergo a deformation at least in correspondence of at least one of said two sub-portions of the second end of the anchoring portion and/or in correspondence of said second end of at least one of said first and second fastening portion, when the device is subjected to a force having a component parallel to the reference plane with such an intensity as to cause said deformation.

[0023] In one aspect, the first and second fastening portion are distinct and separate from one another.

[0024] In one aspect, the first and second fastening portion lie in offset position (with respect to a line lying on the reference plane and orthogonal to said direction of development), so as to lie on opposite sides with respect to said notch.

[0025] In one aspect, the notch lies in a mid-position of said anchoring portion, so that said two sub-portions are two half-portions of the aforesaid second end.

[0026] In one aspect, said first end of said anchoring portion comprises a through hole or a hook apt to enable the personal protective device worn by the operator to be hooked.

[0027] In one aspect, said first fastening portion and/or said second fastening portion comprise a respective fastening through hole in their respective first end.

[0028] In one aspect, said first and second fastening portion are parallel to one another.

[0029] In one aspect, said anchoring portion and/or said first fastening portion and/or said second fastening portion are substantially shaped as plates, preferably having said thickness.

[0030] In one aspect, said main body is made as one piece.

[0031] In one aspect, the notch develops substantially along a straight line, preferably exactly along a straight line.

[0032] In one aspect, said straight line forms with said direction of development an angle less than or equal to 40°, preferably less than or equal to 20°, still more preferably less than or equal to 10°. In an optimal embodiment, said straight line is arranged parallel to said direction of development.

[0033] Typically, said straight line is substantially orthogonal to said respective end segment of the two sub-portions.

[0034] In one aspect, said respective end segments of the two sub-portions lie on the same straight line.

[0035] In one aspect, the notch has an initial end in correspondence of said respective end segments of the two sub-portions of the second end of the anchoring portion. In an alternative aspect, the initial end lies in rear position with respect to said two end segments.

[0036] In one aspect, said main body is made starting from one plate-like element by means of cutting and folding operations, wherein typically cutting defines the outline of said main body and folding occurs at least along said respective end segments of the two sub-portion, so

as to define said first and second fastening portion.

[0037] In one aspect, folding occurs also along a respective initial segment of the two sub-portions, preferably placed in correspondence of a final end of the notch, opposed to the initial end. In an alternative embodiment, these respective initial segments are placed in correspondence of a mid-portion of the notch between the two ends thereof.

[0038] In one aspect, folding occurs also along a respective intermediate segment of the first and second fastening portion, placed in mid-position between the respective first and second end of the fastening portion.

[0039] In one aspect, said second ends of the first and second fastening portion and said sub-portions of the second end of the anchoring portion are folded (after obtaining said notch) away from said reference plane into the two aforesaid half-spaces, respectively, so as to cause the opening of said notch.

[0040] In one aspect, said sub-portions of the second end of the anchoring portions extend substantially parallel to said respective support plane of the respective fastening portion.

[0041] In one aspect, said second end of said first and/or second fastening portion is substantially parallel to said reference plane.

[0042] In one aspect, each sub-portion lies in a plane transversal (preferably orthogonal) to the second end of the respective fastening portion.

[0043] In one aspect, said main body is made of steel, preferably galvanized steel, of stainless steel, of aluminum, of a metal alloy, of plastic material or of any other suitable material.

[0044] In one aspect, said main body is substantially T-shaped.

[0045] In one aspect, said first fastening portion and/or said second fastening portion develop, on said respective support plane, substantially along a respective second longitudinal direction.

[0046] In one aspect, the anchoring portion has a length, along said direction of development, of more than or equal to 50 mm. In one embodiment, this length is preferably more than or equal to 100 mm, still more preferably more than or equal to 200 mm.

[0047] In one aspect, the anchoring portion has a length, along said direction of development, of less than or equal to 400 mm, preferably of less than or equal to 350 mm, still more preferably of less than or equal to 300 mm.

[0048] In one aspect, the first fastening portion and/or the second fastening portion have a length, along said respective second longitudinal direction, of more than or equal to 30 mm, preferably of more than or equal to 60 mm.

[0049] In one aspect, the first fastening portion and/or the second fastening portion have a length, along said respective second longitudinal direction, of less than or equal to 150 mm, preferably of less than or equal to 120 mm (typically about 90 mm).

[0050] In one aspect, said thickness is more than or equal to 2 mm (preferably more than or equal to 3 mm) and/or less than or equal to 10 mm (preferably less than or equal to 5 mm).

[0051] In one aspect, the invention relates to a fall protection anchoring system comprising the aforesaid device installed on the roof of a building, the roof typically comprising a supporting structure and a covering, or on another fixed structure of the building, so that said first fastening portion and/or said second fastening portion are fastened to said supporting structure of the roof, typically below said covering, or to said fixed structure, and said anchoring portion protrudes from said supporting structure, typically above said covering, or from said fixed structure and can be connected to an individual protection device worn by an operator, in correspondence of said first end.

[0052] In one aspect, said first fastening portion and/or said second fastening portion are fastened to the roof or to the fixed structure of the building by means of respective fastening means, e.g. a chemical anchoring (e.g. a resin) or a mechanical anchoring (e.g. a screw or a plug).

[0053] In one aspect, the system comprises the aforesaid fastening means.

[0054] In one aspect, the fall protection anchoring system comprises a safety cable having an end anchored to said first end of the device.

[0055] In one aspect, the invention relates to a building having a roof, or other fixed structure, to which at least one anchoring system according to the above is fastened, typically a plurality of systems suitably distanced from one another.

[0056] In one further aspect, the invention relates to a fall protection safety method comprising the following steps:

- providing the device according to the present invention,
- installing said device on a roof or other fixed structure of a building, the roof typically comprising a supporting structure and a covering, so that said first fastening portion and/or said second fastening portion is fastened to said supporting structure, typically below the covering, and said first end protrudes from the roof, typically above said covering, or from the fixed structure.

[0057] In one further aspect, the invention relates to a use of the device according to the present invention as a fall safety device, comprising the steps of installing said device on a roof or other fixed structure of a building, the roof typically comprising a supporting structure and a covering, so that said first fastening portion and/or said second fastening portion is fastened to said supporting structure, typically below the covering, or to said fixed structure, and said first end protrudes from the roof, typically above said covering, or from the fixed structure.

[0058] Further characteristics and advantages of the

present invention will appear better from the detailed description of some exemplary though not exclusive embodiments, among which also a preferred embodiment, of a fall protection anchoring system and of a fall protection safety method according to the present invention. This description will be disclosed below with reference to the accompanying drawings, provided to a merely indicative and therefore non-limiting purpose, in which:

- Figure 1 is a perspective view of a possible embodiment of the fall protection anchoring device according to the present invention;
- Figure 2 is a perspective view of a possible variant of embodiment of the device of Figure 1;
- Figure 3 is a perspective view of another embodiment of the fall protection anchoring device according to the present invention.

[0059] With reference to the accompanying figures, a fall protection safety device according to the present invention is globally referred to with the numeral 1. In general, the same numeral is used for identical or similar elements, if required in their variants of embodiment.

[0060] The fall protection anchoring device 1, apt to enable an operator to work safely on a roof or other fixed structure of a building, comprises a main body 2 having an anchoring portion 3 having a thickness 4 and developing along a direction of development 6 at least partially (as shown by way of example in Figure 3) or totally (as shown in Figure 1 and 2) in a reference plane and intended to be anchored on a first end 3a thereof to a personal protection device worn by the operator (not shown). The main body 2 further has at least a first fastening portion 7 and a second fastening portion 8, separate from one another, intended to be fastened on a respective first end 7a and 8a thereof to the fixed structure of the building, and integral, in correspondence of a respective second end 7b and 8b thereof, opposed to said first end, with the anchoring portion 3. The first and second fastening portion 7 and 8 are integral with the two sub-portions 70 and 80, respectively, and develop from the respective end segment 97 and 98 of the two sub-portions.

[0061] As shown by way of example in the figures, the first and second fastening portion 7 and 8 are arranged in two opposed half-spaces with respect to said reference plane and lie at least partially (as shown in Figure 3) or totally (as shown in Figure 1 and 2) on a common support plane orthogonal to the reference plane. The anchoring portion 3 comprises, in correspondence of a second end 3b thereof, a notch 11 through the thickness 4 and apt to divide along a separation line corresponding to the notch 11 the second end 3b of the anchoring portion 3 into two sub-portions 70 and 80. The first fastening portion 7 and the second fastening portion 8 lie in offset position (with respect to a line lying on the reference plane) so as to lie on opposite sides with respect to the notch 11. The main body 2 thus described can undergo deformation at least in correspondence of at least one of

the two sub-portions 70 and 80 of the second end 3b of the anchoring portion 3 and/or in correspondence of the second end 7b and 8b of at least one of the first and second fastening portion 7 and 8, typically when the device 1 is subjected to a sufficient impulsive tensile stress having a component parallel to the reference plane.

[0062] Preferably, as shown by way of example in the figures, the notch 11 lies in mid-position of the anchoring portion 3, so that the two sub-portions 70 and 80 are two identical half-portions of the second end 3b. Preferably, the first end 3a of the anchoring portion 3 comprise a through hole 3, apt to allow to anchor the personal protection device worn by the operator.

[0063] Preferably, the first fastening portion 7 and/or the second fastening portion 8 comprise a respective fastening through hole 17 and 18 in their respective first end 7a and 8a.

[0064] Preferably, the first and second fastening portion 7 and 8 are parallel to one another, as shown by way of example in the figure.

[0065] Preferably, the anchoring portion 3 and the first fastening portion 7 and the second fastening portion 8 are substantially shaped as plates, and preferably have the aforesaid thickness 4.

[0066] Preferably, as in the embodiments shown by way of example in the figure, the main body 2 is made as one piece.

[0067] Preferably, the main body 2 is made starting from one plate-like element by cutting and folding operations, wherein cutting typically defines the outline of the main body and folding occurs at least along said respective end segments 97 and 98 of the two sub-portions of the second end 3b of the anchoring portion 3, so as to define said first and second fastening portion 7 and 8.

[0068] Preferably, the notch 11 develops substantially along a straight line parallel to the direction of development 6 and orthogonal to the respective end segments 97 and 98, as in the examples of embodiment shown in the figures.

[0069] Preferably, as shown in Figures 1 and 2, the respective end segments 97 and 98 of the sub-portions of the second end 3b of the anchoring portion 3 lie on the same straight line. As an alternative, as shown in Figure 3, they can lie on two offset straight lines, typically parallel to one another.

[0070] Preferably (as shown in all the figures), the notch 11 has an initial end 11a lying in correspondence of the end segments 97 and 98 of the second end 3b of the anchoring portion 3. In an alternative embodiment (not shown), the initial end 11a lies in rear position along the direction of development 6 with respect to the end segments 97 and 98, e.g. by means of a weld spot applied between the two end segments 97 and 98. In this case, although the two sub-portions 70 and 80 are not separated from one another in correspondence of the end segments, in the presence of a sufficiently strong stress along the plane of reference, the weld or connection spot does however "come off", enabling the main body to de-

form as in the present invention.

[0071] Figure 3 shows an embodiment of the invention. It should be noted that this embodiment can be obtained from the embodiment of Figures 1 and 2 by means of two further pairs of folding operations, the first one along respective initial segments 57 and 58 of the two sub-portions 70 and 80, lying in correspondence of a final end 11b of the notch, opposed to said initial end 11a, the second one along respective intermediate segments 67 and 68 of the first and second fastening portion 7 and 8, lying in mid-position between the respective first and second end of the respective fastening portion. Thus, the second ends 7b and 8b of the first and second fastening portion 7 and 8 and the sub-portions 70 and 80 of the second end 3b of the anchoring portion 3 are folded, after making the notch 11, away from the reference plane into the two aforesaid half-spaces, respectively, so as to cause the opening of the notch 11. As a result, it is evident that also the embodiment of Figure 3 comprises the aforesaid notch 11.

[0072] In an alternative embodiment (not shown), the respective initial segments 57, 58 lie in correspondence of a mid-position of the notch 11 between the two ends 11a and 11b thereof. This latter embodiment can be regarded as a combination of the embodiments shown in Figure 2 (or 1) and 3.

[0073] In the embodiment shown, the sub-portions 70 and 80 of the second end 3b of the anchoring portion 3 extend parallel to the support plane, and the second end 7b, 8b of the first and second fastening portion 7, 8 is substantially parallel to the reference plane.

[0074] Typically, each sub-portion 70, 80 lie in a plane orthogonal to the second end 7b, 8b of the respective fastening portion 7, 8.

[0075] Preferably, the main body 2 is made of steel, preferably galvanized steel.

[0076] In one embodiment, shown by way of example in Figure 1, the anchoring portion 3 has a length, along the direction of development, of about 90 mm.

[0077] In another embodiment, shown by way of example in Figure 2, the anchoring portion 3 has a length, along the direction of development, of about 260 mm.

[0078] Preferably, the length of the notch 11 along the direction of development is more than or equal to one fourth of and less than or equal to half the length of the anchoring portion, typically about one third of this length.

[0079] Preferably, as shown by way of example in the figures, the first fastening portion 7 and/or the second fastening portion 8 have a length, along a respective second longitudinal direction 20a and/or 20b, of about 90 mm.

[0080] Preferably, as in the embodiments shown by way of example in the figures, the thickness 4 of the main body 2 is of about 4 mm.

[0081] Preferably, the first fastening portion 7 and/or the second fastening portion 8 are fastened to the roof or to the fixed structure of the building by respective fastening means, of known type and not shown in the figures,

e.g. a chemical anchoring (e.g. a resin) or a mechanical anchoring (e.g. a screw or a plug).

[0082] For the operation of the device 1 it must be installed, by fastening the fastening portion 7 and 8, on the supporting structure of a roof or on the fixed structure of a building.

[0083] According to the Applicant, the configuration of the portions described above which make up the device gives the main body a given deformability in case of strong tensile stress. This results in that, in case of fall of the operator fastened to the device, this stress of impulsive nature is not discharged on a highly stiff structure (which typically reacts with a sudden break or transmits onto the anchoring means of the device such a force as to cause the tear thereof from the fixed structure of the building) but on a main body having a compliance between the fastening portions 7 and 8 and the anchoring portion 3, thus maintaining the integrity of the fastening portions, of the anchoring portion and of the fastening means. In particular, when the operator falls, the stress causes the yielding of the material which the main body is made of, with subsequent plastic deformation thereof. This corresponds to a change in the shape of the main body due to the absorption of the energy related to the stress. The device described in the present invention is therefore further able to reduce the tear discharged on the operator's body, when the fall ends, due to the passage of the energy developed during fall to the device. As a matter of fact, it acts as a shock absorber, expanding the time in which the stress acts and making the tear on the operator less stiff. This time corresponds to the interval in which the main body is plastically deformed. This plastic deformation can typically occur in correspondence of the notch 11 which, during fall, enables the two sub-portions 70 and 80 of the second end 3b of the anchoring portion 3 to get away from one another. Analogously, along the respective segments 97 and 98 the sub-portions 70 and 80 can be folded with respect to the second ends 7b and 8b of the fastening portions 7 and 8, respectively. The notch 11 described above enables to change, by folding the sub-portions 70 and 80 and the second ends 7b and 8b, the configuration of the device, providing a structural pathway between the first end 3a of the anchoring portion 3 (to which the operator is connected) and the first ends 7a and 7b of the fastening portions 7 and 8 (where the device is fastened to the fixed structure of the device) with a variable length as a result of the presence of stresses. Therefore, the spacing apart of the first end 3a of the anchoring portion 3 from the first ends 7a or 7b of the fastening portions 7 and 8 due to stress is reabsorbed by the deformation of the main body without causing tears and/or breaks.

[0084] In one embodiment, not shown, the initial end 11a is in rear position with respect to the end segments 97 and 98. The joining point (e.g. by welding) between the two segments allows to define tension for the main body, establishing a limit deformation below which the device does not get deformed. Below this value are the

low stresses that are typical of a normal pulling of the device by the operator when working. Beyond this limit stress, depending on the size and type of the joining point, the latter breaks and puts in communication the notch with the respective end segments 97 and 98 and restoring the deformability properties as described above.

[0085] As far as the installation of the device is concerned, as said above, it is fastened to a supporting structure of the roof or to a fixed structure of the building.

[0086] Typically, if a covering has to be made on the supporting structure of the roof, the device must be installed before carrying out this covering.

[0087] This covering typically consists of a plurality of covering elements arranged side by side or partially overlapping so as to cover, e.g. totally, the roof surface.

[0088] So that the anchoring portion 3, or at least the first end 3a thereof comprising the through hole 13, can protrude from the covering and be available to the operator for anchoring his/her personal protective device, it is necessary that the covering element to lay on the device is provided with a suitable slot, previously made therein, in which the aforesaid anchoring portion, or at least the first end 3a thereof, can get through.

[0089] In general, several devices are typically installed on a single roof or building, spaced apart and distributed on the surfaces on which the operator may work, so that when performing his/her job, by connecting every time to a different device or changing from one device to an adjacent one, s/he can cover the whole roof and/or other surfaces in every direction according to the various needs, though always remaining secured to the device so as to eliminate risks of accident due to fall from height. It is also possible to connect two or more devices according to the present invention by means of a metal cable (e.g. made of steel), so as to make a sliding guide for a personal protective device, e.g. of the type commonly referred to as safety line.

[0090] Preferably, as shown by way of example in Figures 1 and 2, the main body is substantially T-shaped. Different embodiments, in which for instance said main body has a configuration in which the first and second fastening portion are not coplanar to one another, e.g. lie on orthogonal and/or transversal planes and/or are not both orthogonal to said anchoring portion (since at least one of them is transversal or parallel thereto), are to be regarded as embodiments of the present invention and encompassed in the scope of protection as claimed below. These different embodiments can be suitably used if the device requires particular shapes apt to enable the installation thereof in points of the supporting structure of the roof or of the fixed structure of the building defining a non-planar support, such as e.g. sharp corners, either internal or external, curved or discontinuous surfaces, beams, etc.

Claims

1. A fall protection anchoring device (1), apt to allow an operator to work safely on a roof or another fixed structure of a building, comprising a main body (2) having an anchoring portion (3) having a thickness (4) and developing along a direction of development (6) at least partially in a reference plane and intended to be anchored on a first end (3a) thereof to a personal protection device worn by the operator, said main body (2) further having at least a first fastening portion (7) and a second fastening portion (8), intended to be fastened on a respective first end (7a, 8a) thereof to the fixed structure of the building, and integral, in correspondence of a respective second end (7b, 8b) thereof, opposed to said first end, with said anchoring portion (3), said first and second fastening portion (7, 8) being arranged in two opposed half-spaces with respect to said reference plane and lying at least partially on a respective support plane, at least one of which being transversal to said reference plane, said anchoring portion (3) comprising in correspondence of a second end (3b) thereof, opposed to said first end (3a), a notch (11) through said thickness (4) and apt to divide along a separation line corresponding to said notch said second end (3b) of the anchoring portion (3) into two sub-portions (70, 80), said first fastening portion (7) and second fastening portion (8) being integral with said two sub-portions (70, 80), respectively, and developing from a respective end segment (97, 98) of said two sub-portions.
2. The device (1) according to claim 1, wherein said main body (2) can undergo a deformation at least in correspondence of at least one of said two sub-portions (70, 80) of the second end (3b) of the anchoring portion (3) and/or in correspondence of said second end (7b, 8b) of at least one of said first and second fastening portion (7, 8), when the device (1) is subjected to a force having a component parallel to the reference plane with such an intensity as to cause said deformation.
3. The device (1) according to claim 1 or 2, wherein the first and second fastening portion (7, 8) are distinct and separate from one another and lie in offset position with respect to a line lying on the reference plane and orthogonal to said direction of development (6), so as to lie on opposite sides with respect to said notch (11).
4. The device (1) according to any one of the preceding claims, wherein the notch (11) lies in a mid-position of said anchoring portion (3), so that said two sub-portions (70, 80) are two identical half-portions of the aforesaid second end (3b) of said anchoring portion (3).

5. The device (1) according to any one of the preceding claims, wherein said anchoring portion (3) and/or said first fastening portion (7) and/or said second fastening portion (8) are substantially shaped as plates, preferably having said thickness (4), the main body (2) being obtained from one plate-like element by cutting and folding operations, wherein folding occurs at least along said respective end segments (97, 98) of the two sub-portions (70, 80), so as to define said first and second fastening portion (7, 8).
6. The device (1) according to claim 5, wherein folding occurs also along a respective initial segment (57, 58) of the two sub-portions (70, 80) and folding occurs also along a respective intermediate segment (67, 68) of the first and second fastening portion (7, 8), placed in mid-position between the respective first (7a, 8a) and second (7b, 8b) end of the fastening portion (7, 8).
7. The device (1) according to any one of the preceding claims, wherein the notch (11) develops substantially along a straight line forming with said direction of development (6) an angle less than or equal to 40° .
8. The device (1) according to any one of the preceding claims, wherein the notch (11) has an initial end (11a) on said respective end segments (97, 98) of the two sub-portions (70, 80) of the second end (3b) of the anchoring portion (3), so as to separate said two sub-portions (70, 80) also on their respective end segments (97, 98).
9. The device (1) according to any one of the preceding claims, wherein said respective end segments (97, 98) of the two sub-portions (70, 80) lie on the same straight line.
10. A fall protection safety method comprising the steps of providing a device (1) according to any one of the claims 1 to 9, and installing said device (1) on a fixed structure of a building, so that said first fastening portion (7) and/or said second fastening portion (8) is fastened to said fixed structure, and said first end (3a) of said anchoring portion (3) protrudes from the fixed structure.

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Fig. 1

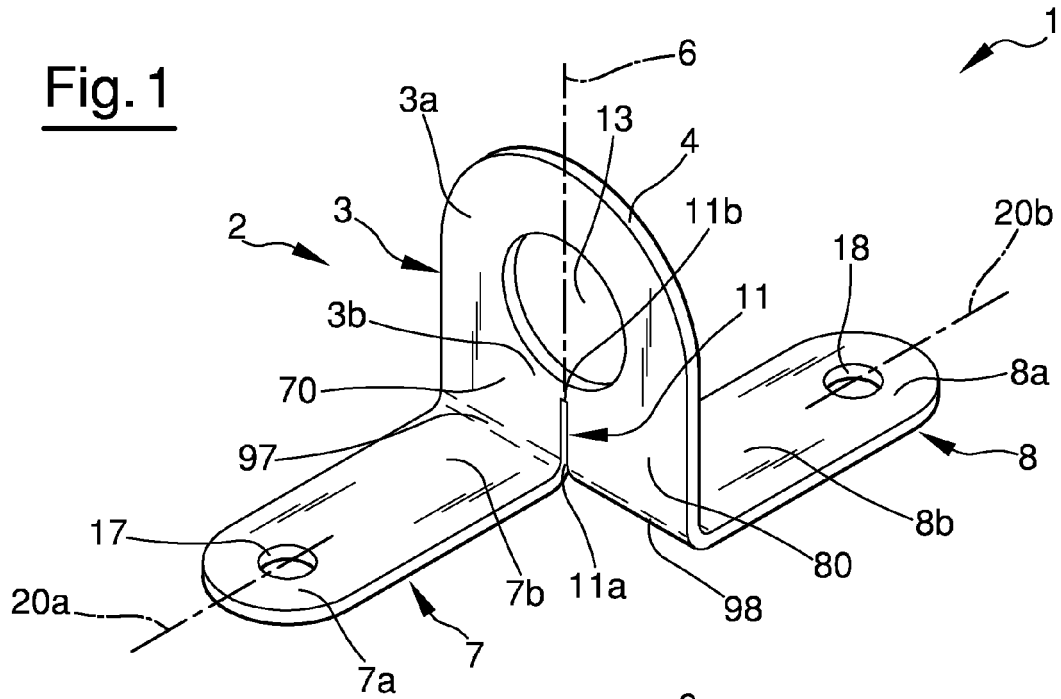
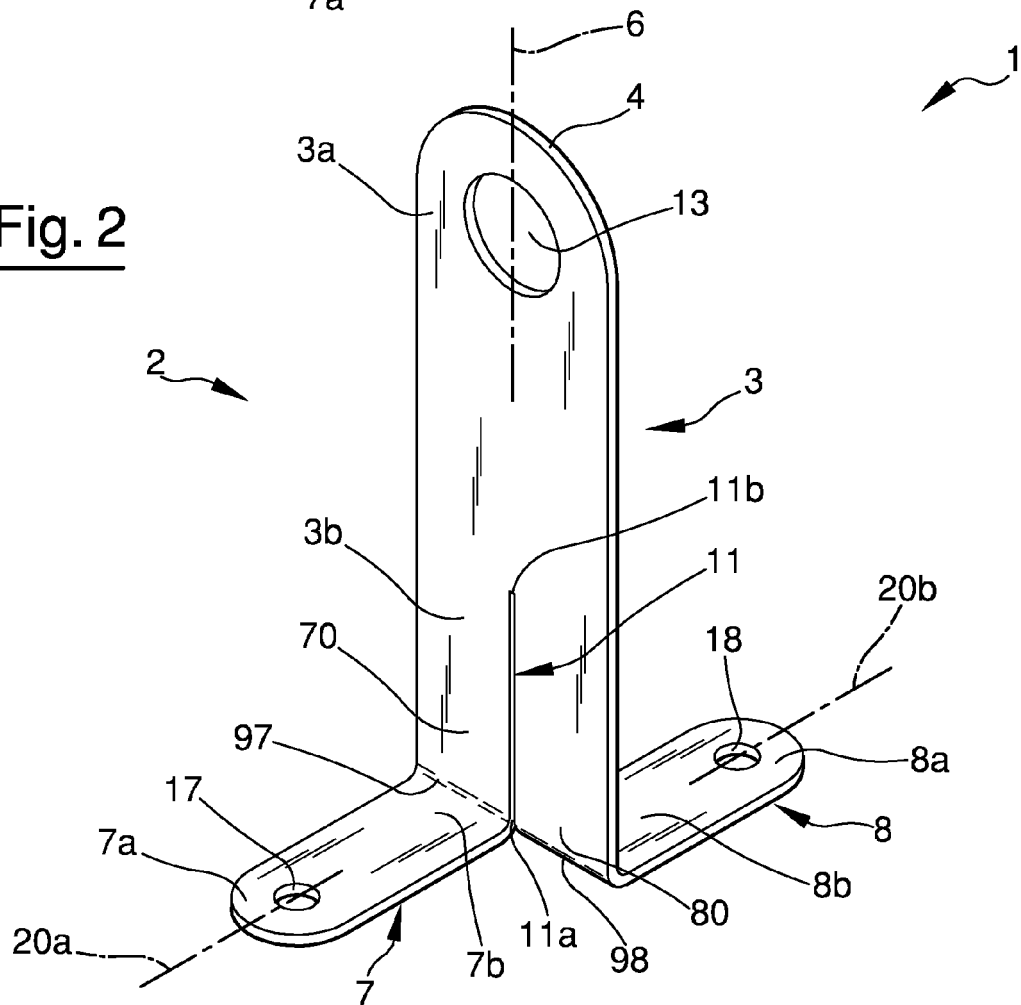


Fig. 2



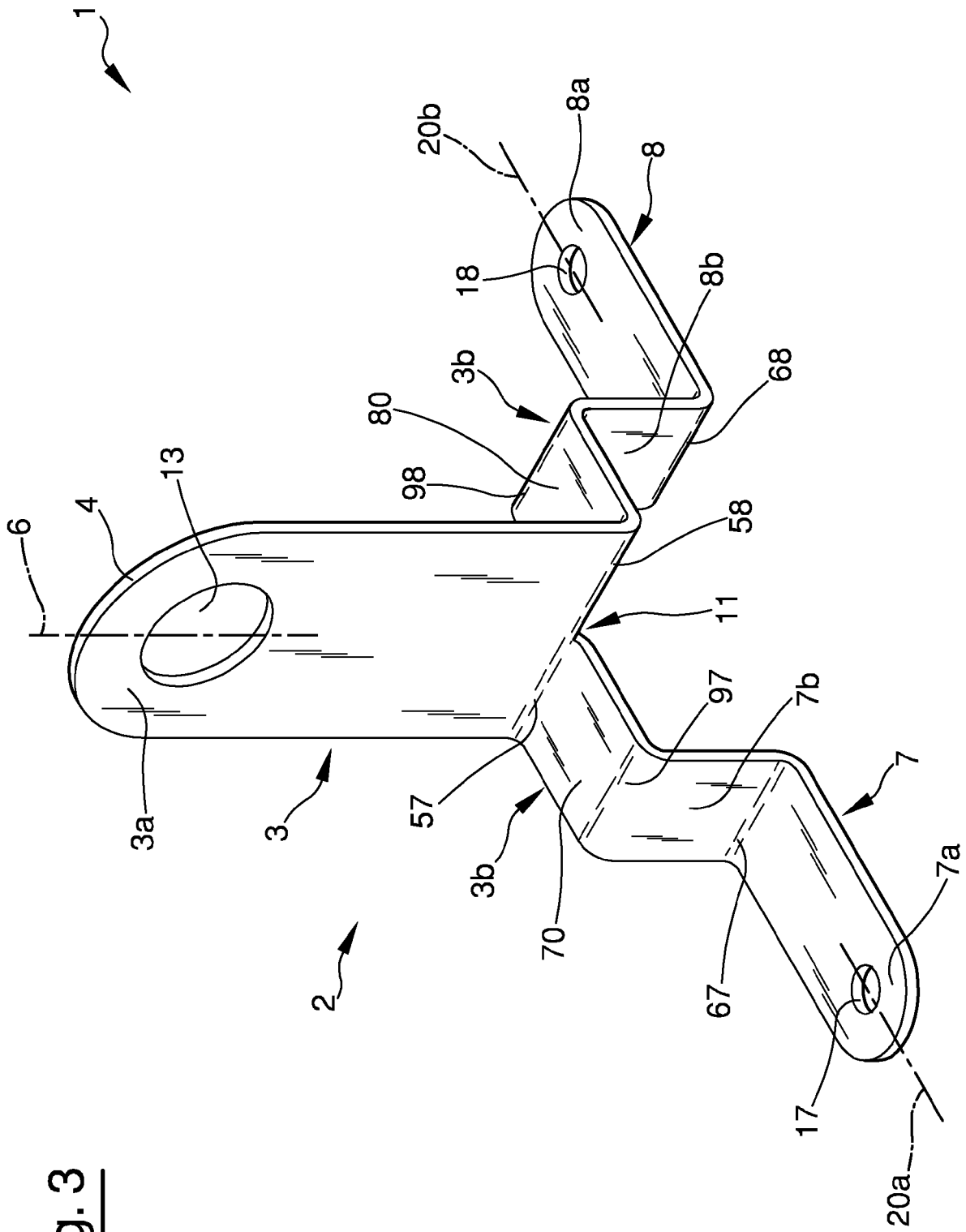


Fig. 3



EUROPEAN SEARCH REPORT

Application Number
EP 10 17 5500

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	AU 697 769 B2 (MOXHAM IND PTY LTD) 15 October 1998 (1998-10-15) * figures 4-12 * -----	1-10	INV. E04G21/32 A62B35/04
			TECHNICAL FIELDS SEARCHED (IPC)
			E04G A62B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 7 January 2011	Examiner Andlauer, Dominique
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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07-01-2011

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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