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[Continued on next page]

- (54) **Title:** U-CLIP ASSEMBLY

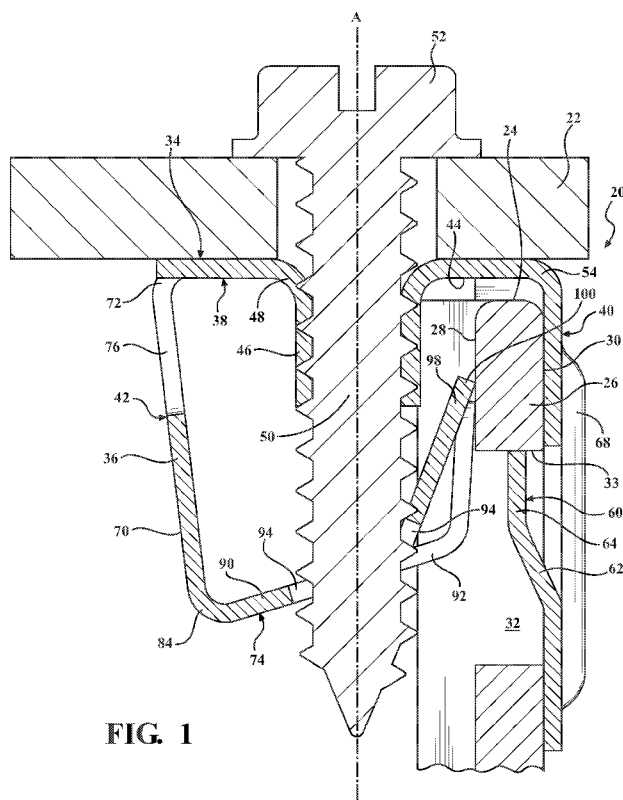


FIG. 1

- (57) **Abstract:** A U-clip assembly (20) for a securing a component (22) to an edge (24) of a panel (26) having an aperture (32) therethrough. The U-clip assembly includes a U-shaped body (34) with a back support member (40) and a front support member (42) each extending transversely from a base for straddling the edge of the panel. A cylinder (46) extends from a lower surface of the base and together define a first bore for threadedly receiving a screw (52). The back support member defines a retaining tab (60) for engaging the aperture of the panel. The front support member defines a pair of slots to define a central portion therebetween and two outer portions with the central portion extending to a blade for engaging a face of the panel to secure the body thereupon and with each of the outer portions defining secondary clamping members for engaging the same face of the panel and further secure the body thereupon.



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U-CLIP ASSEMBLY

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This PCT International Patent Application claims the benefit of U.S. Patent Application Serial No. 15/071,720 filed March 16, 2016 entitled “U-Clip Assembly,” the entire disclosure of the application being considered part of the disclosure of this application and hereby incorporated by reference.

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0002] A U-clip assembly for a securing a component to an edge of a panel.

2. Discussion

[0003] U-clip assemblies are used in various industries, including the automotive industry, to retain edges of panels to other components. For example, a U-clip assembly may be used to retain a door trim panel to an edge of a supporting metal sheet of the door.

SUMMARY OF THE INVENTION

[0004] The invention provides for a U-clip assembly for securing a component to an edge of a panel. The U-clip assembly includes a body of generally U-shape including a base with a back support member and a front support member extending transversely therefrom for straddling the edge of the panel, and wherein the base includes a lower surface disposed between the support members. The base defines a first bore between the support members for receiving a fastener for securing the component. The back support member includes a retaining tab extending toward the base for engaging the panel to secure the U-clip assembly thereupon. The front support member includes a wall portion extending from the base and defines a pair of sides in spaced and parallel relationship to one another, and a pair of slots extending parallel to and spaced from the sides to define a central portion therebetween, and an outer portion outwardly of each of the slots. The

central portion defines a primary clamping member extending generally toward the base and away from the wall portion to a blade for engaging the first face of the panel to secure the U-clip assembly thereupon.

[0005] The invention in its broadest aspect therefore provides for U-clip assembly that can be installed on an edge of a panel with a low insertion force, preferably below 45 N, and provides a high retention force, preferably above 900 N. The invention also provides for a U-clip assembly that, in the single action of inserting a fastener, secures the fastener to the U-clip assembly, biases the primary clamping member into the first face of the panel to secure the U-clip assembly thereupon, and indirectly increases the clamping force between the secondary clamping members and the first face of the panel.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] Other advantages of the present invention will be readily appreciated, as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

[0007] Figure 1 is a cut-away side view of the preferred embodiment of the subject U-clip assembly securing a component to an edge of a panel;

[0008] Figure 2 is a perspective view of the preferred embodiment of the subject U-clip assembly securing a component to an edge of a panel;

[0009] Figure 3 is a perspective view of the preferred embodiment of the subject U-clip assembly;

[0010] Figure 4 is a perspective view of the preferred embodiment of the subject U-clip assembly; and

[0011] Figure 5 is a perspective view of the preferred embodiment of the subject U-clip assembly.

DESCRIPTION OF THE ENABLING EMBODIMENT

[0012] Referring to the Figures, wherein like numerals indicate corresponding parts throughout the several views, a U-clip assembly **20** is generally shown for a securing a component **22** to an edge **24** of a panel **26** having a first face **28** and a second face **30** and an aperture **32** extending between the faces **28**, **30** and defining a rim **33** opposite the edge **24**. The U-clip assembly **20** includes a body **34** of generally U-shape including a base **38** having a generally rectangular shape and a back support member **40** and a front support member **42**. The support members **40**, **42** each extend transversely from the base **38** and are generally parallel to one other for straddling the edge **24** of the panel **26**, and the base **38** includes a lower surface **44** between the support members **40**, **42**. The body **34** of the U-clip assembly **20** extends between a pair of sides **36** in spaced and parallel relationship to one another.

[0013] As shown in Figure 1, a cylinder **46** extends from the lower surface **44** along an axis **A** perpendicular to and centered on the base **38** between the support members **40**, **42**. A collar **48** having a generally frustoconical shape is disposed between the base **38** and the cylinder **46** along the axis **A**. It should be appreciated that collar **48** could be formed with any taper or that the cylinder **46** may extend directly from the lower surface **44** without a collar **48** therebetween. The base **38**, the cylinder **46**, and the collar **48** together define a first bore **50** that has threads extending therethrough for threadedly receiving a fastener, which may be a screw **52**.

[0014] As best shown in Figure 4, the back support member **40** has a generally rectangular shape and extends perpendicularly from the base **38** along a first bend **54** for engaging the second face **30** of the panel **26**. The back support member **40** defines a pair of shoulders **55** extending outwardly and away from the base **38** and a pair of rounded corners **56** opposite the base **38**. The back support member **40** also includes a pierced portion **58**

centered thereupon with a generally circular shape to define a retaining tab **60** having an angled portion **62** extending from the back support member **40** toward the base **38** for engaging the edge **24** of the panel **26** when the U-clip assembly **20** is installed thereon. A pair of stiffening ribs **68** protrude outwardly from the back support member **40** opposite the base **38** and extending parallel to the sides **36** and flanking the retaining tab **60**.

[0015] As shown in Figure 2, the retaining tab **60** continues beyond the angled portion **62** to an upper portion **64** that extends parallel to the back support member **40** toward the base **38** and defines a top **66** having an arched shape for engaging the rim **33** of the aperture **32** of the panel **26** to secure the U-clip assembly **20** thereupon and provide a retention force in opposition to a pulling force on the screw **52**.

[0016] As best illustrated in Figure 1, when the U-clip assembly **20** is installed on the panel **26**, the retaining tab **60** is bent outwardly by the engagement of the angled portion **62** with the edge **24** of the panel **26**. When the U-clip assembly **20** is positioned with the upper portion **64** of the retaining tab **60** overlying the aperture **32** of the panel **26**, the retaining tab **60** will snap back inwardly to its natural position with an audible “click,” which can signal that the U-clip assembly **20** is in position on the panel **26** for operable use.

[0017] Figure 2 also shows the front support member **42** including a wall portion **70** that extends generally perpendicularly from the base **38** along a second bend **72** to a floor **74** opposite the base **38**. Figure 3 shows a first hole **76** disposed in the wall portion **70** centrally between the sides **36** and extending from the second bend **72** to a lower end **78** between the base **38** and the floor **74**. The base **38** includes a notch **80** proximate to each of the sides **36** and adjoining the first hole **76** to define a ledge **82** on the base **38** therebetween.

[0018] Figure 5 shows the floor **74** extending from a third bend **84** toward the back support member **40** between the sides **36** and generally perpendicularly to the wall portion **70** of the front support member **42**. The wall portion **70** defines a pair of second holes **88**

each having a circular shape and located adjacent the third bend **84** and the sides **36**. The front support member **42** defines a slot **86** extending from each of the second holes **88** parallel to and spaced from the sides **36** through the floor **74** to define a central portion **90** therebetween and an outer portion **92** outwardly of each of the slots **86**.

[0019] Figure 3 shows the central portion **90** defining a second bore **94** centered thereupon having a circular shape for receiving the screw **52**. Further, a fourth bend **96** extends thereacross to define a primary clamping member **98** extending at an obtuse angle toward the base **38** and away from the wall portion **70** to a blade **100** spaced and parallel to the base **38** and the front support member **42** for engaging the first face **28** of the panel **26** to secure the U-clip assembly **20** thereupon.

[0020] As shown in Figure 1, the primary clamping member **98** partially overlaps the second bore **94** in the central portion **90** of the floor **74** for engaging the screw **52** and biasing the primary clamping member **98** into engagement with the first face **28** of the panel **26** and to increase the securement force therebetween and for providing a prevailing torque to hold the screw **52** with the body **34** and preventing the screw **52** from loosening prematurely. Engagement between the screw **52** and the primary clamping member **98** also causes wall portion **70** to flex outwardly and thereby causes the secondary clamping member **106** to apply an increased clamping force against the first face **28** of the panel **26**.

[0021] Figure 3 shows each of the outer portions **92** including a straight portion **102** extending along the floor **74** beyond the fourth bend **96** to a fifth bend **104** thereacross to define a secondary clamping member **106** extending at an obtuse angle generally toward the base **38** and away from the wall portion **70** for engaging the first face **28** of the panel **26** to further secure the U-clip assembly **20** thereupon.

[0022] The secondary clamping may also function to align the U-clip assembly **20** during installation on the panel **26**. It may also hold the U-clip assembly **20** in place on the

panel **26** when the screw **52** is not in place to bias the primary clamping member **98** into engagement with the first face **28** of the panel **26**.

[0023] Obviously, many modifications and variations of the present invention are possible in light of the above teachings and may be practiced otherwise than as specifically described while within the scope of the appended claims. These antecedent recitations should be interpreted to cover any combination in which the inventive novelty exercises its utility. The use of the word "said" in the apparatus claims refers to an antecedent that is a positive recitation meant to be included in the coverage of the claims whereas the word "the" precedes a word not meant to be included in the coverage of the claims.

CLAIMS

What is claimed is:

Claim 1. A U-clip assembly for a securing a component to an edge of a panel having a first face, said U-clip assembly including:

a body of generally U-shape including a base and a back support member and a front support member wherein said base includes a lower surface disposed between said support members that extend transversely therefrom for straddling the edge of the panel,

said base defining a first bore between said support members for receiving a fastener,

said back support member including a retaining tab extending toward said base for engaging the panel to secure said U-clip assembly thereupon,

said front support member including a wall portion extending from said base,

said front support member defining a pair of sides in spaced and parallel relationship to one another and a pair of slots extending parallel to and spaced from said sides to define a central portion therebetween and an outer portion outwardly of each of said slots, and

said central portion defining a primary clamping member extending generally toward said base and away from said wall portion to a blade for engaging the first face of the panel to secure said U-clip assembly thereupon.

Claim 2. A U-clip assembly as set forth in claim 1 further including each of said outer portions defining a secondary clamping member extending generally toward said base for engaging the first face of the panel to further secure said U-clip assembly thereupon.

Claim 3. A U-clip assembly as set forth in claim 1 further including said central portion defining a second bore centered thereupon for receiving said fastener.

Claim 4. A U-clip assembly as set forth in claim 3 further including said primary clamping member partially overlapping said second bore for engaging said fastener and biasing said primary clamping member into engagement with the first face of the panel and to increase the securement force therebetween and for holding said fastener with said body to prevent premature loosening.

Claim 5. A U-clip assembly as set forth in claim 1 further including said back support member including a pierced portion to define said retaining tab.

Claim 6. A U-clip assembly as set forth in claim 1 wherein said retaining tab includes an angled portion extending from said back support member toward said base for engaging the edge of the panel when said U-clip assembly is installed thereon.

Claim 7. A U-clip assembly as set forth in claim 6 further including an upper portion that extends beyond said angled portion of said retaining tab and parallel to said back support member toward said base.

Claim 8. A U-clip assembly as set forth in claim 7 further including said upper portion of said retaining tab defining a top having an arched shape for engaging an aperture of the panel.

Claim 9. A U-clip assembly as set forth in claim 1 further including a cylinder extending from said lower surface along an axis perpendicular to and centered on said base.

Claim 10. A U-clip assembly as set forth in claim 9 further including a collar having a frustoconical shape disposed between said lower surface of said base and said cylinder and extending along said axis.

Claim 11. A U-clip assembly as set forth in claim 1 wherein said first bore has threads extending therethrough for threadedly receiving a fastener.

Claim 12. A U-clip assembly as set forth in claim 1 further including a stiffening rib protruding outwardly from said back support member opposite said base.

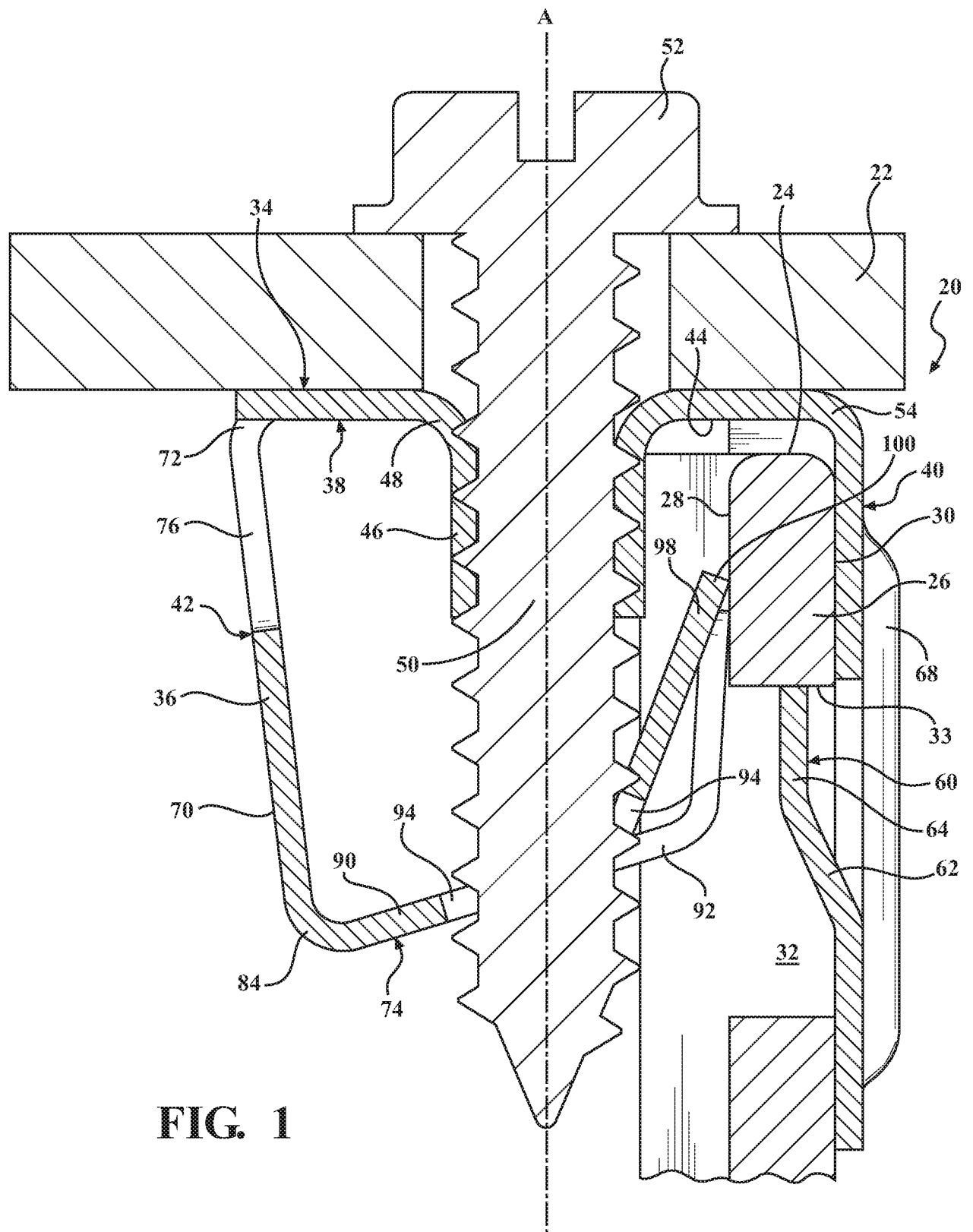
Claim 13. A U-clip assembly as set forth in claim 1 further including said back support member extending from said base along a first bend.

Claim 14. A U-clip assembly as set forth in claim 1 further including said wall portion of said front support member extending from said base to a floor; and

a second bend between said base and said wall portion of said front support member and said floor extending generally perpendicularly from said wall portion along a third bend opposite said base and toward said back support member between said sides.

Claim 15. A U-clip assembly as set forth in claim 1 further including said central portion including a fourth bend thereacross to define said primary clamping member; and

wherein each of said outer portions includes a straight portion extending beyond said fourth bend to a fifth bend thereacross to define a secondary clamping member that extends generally toward said base for engaging the first face of the panel to further secure said U-clip assembly thereupon.



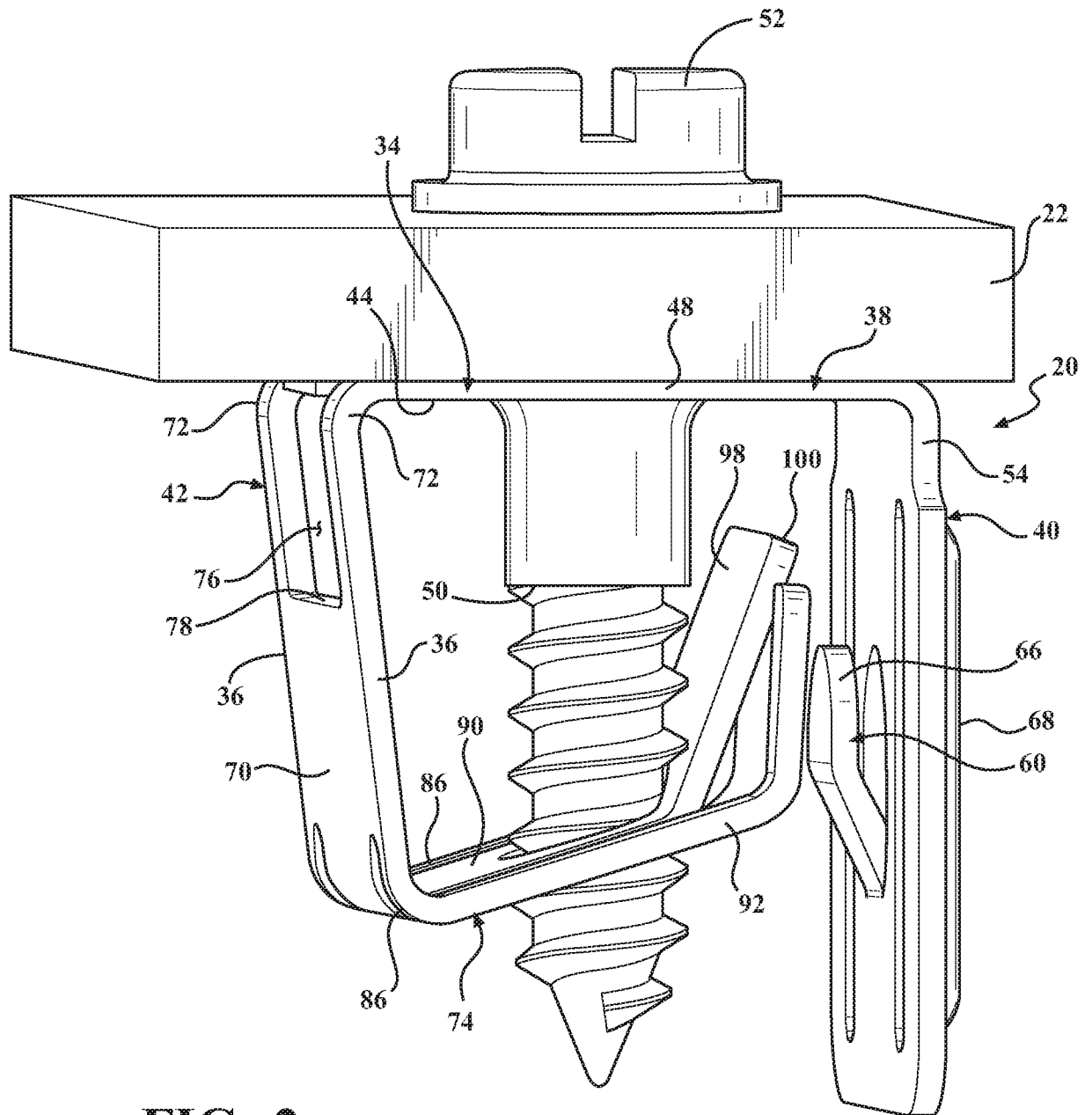


FIG. 2

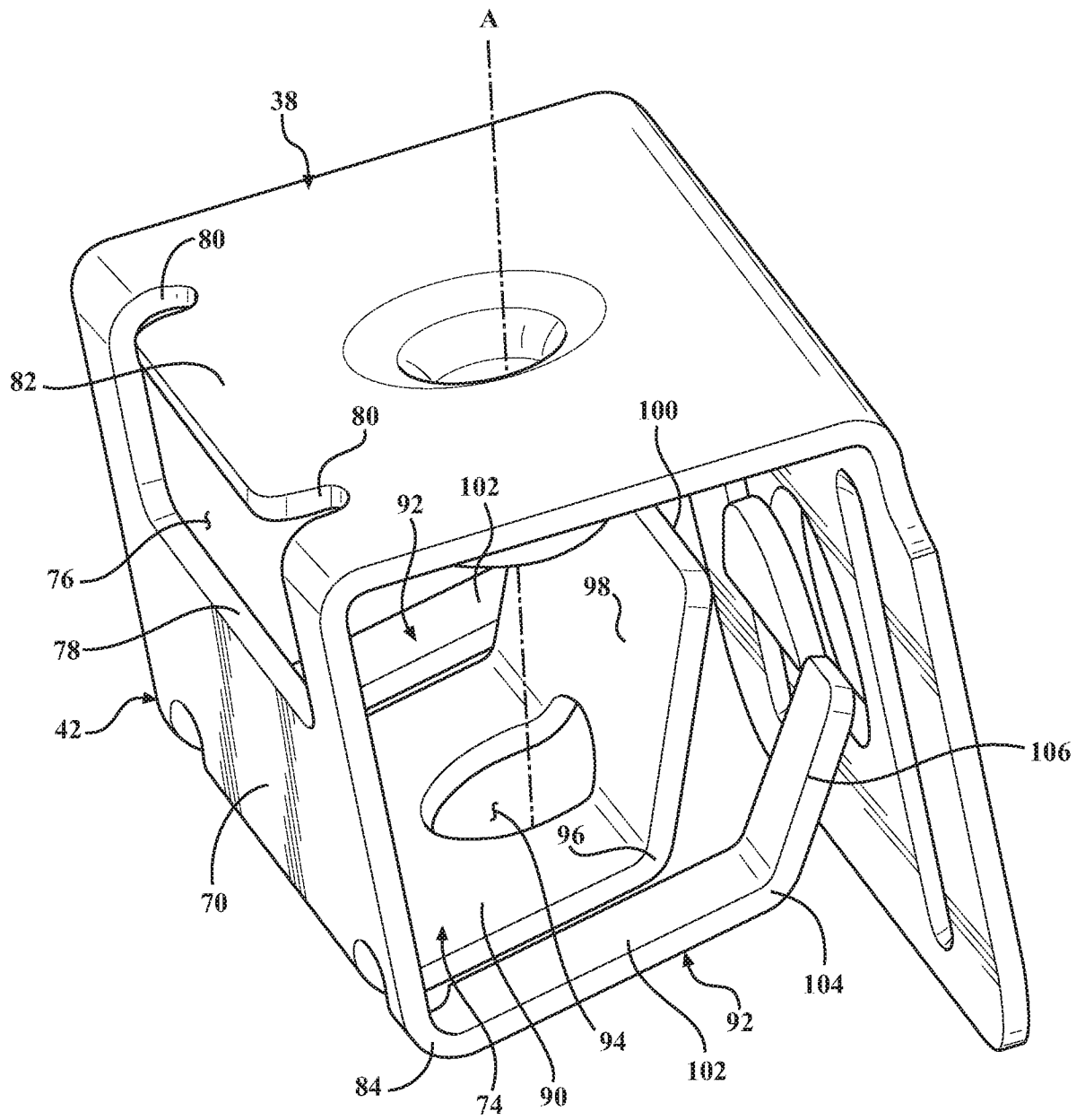


FIG. 3

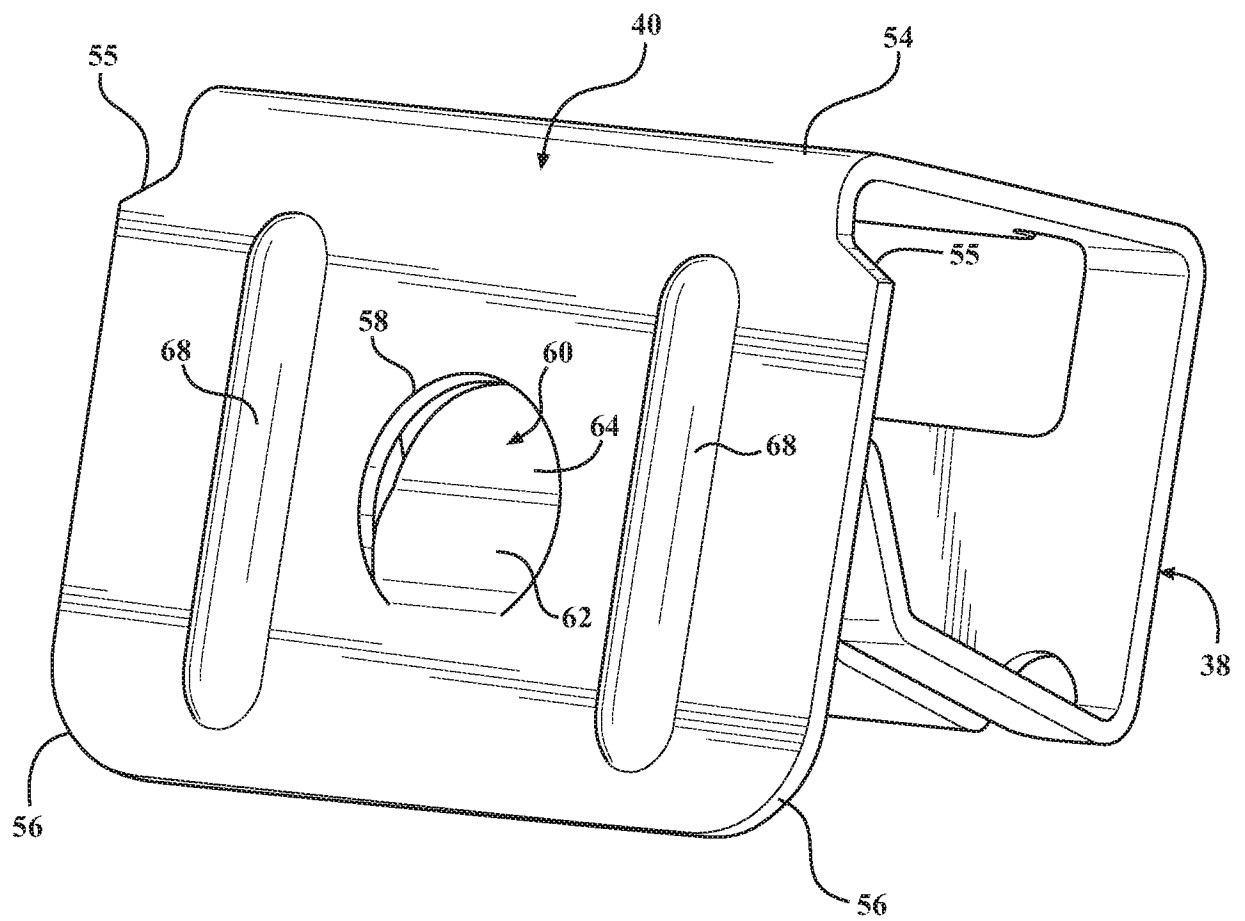


FIG. 4

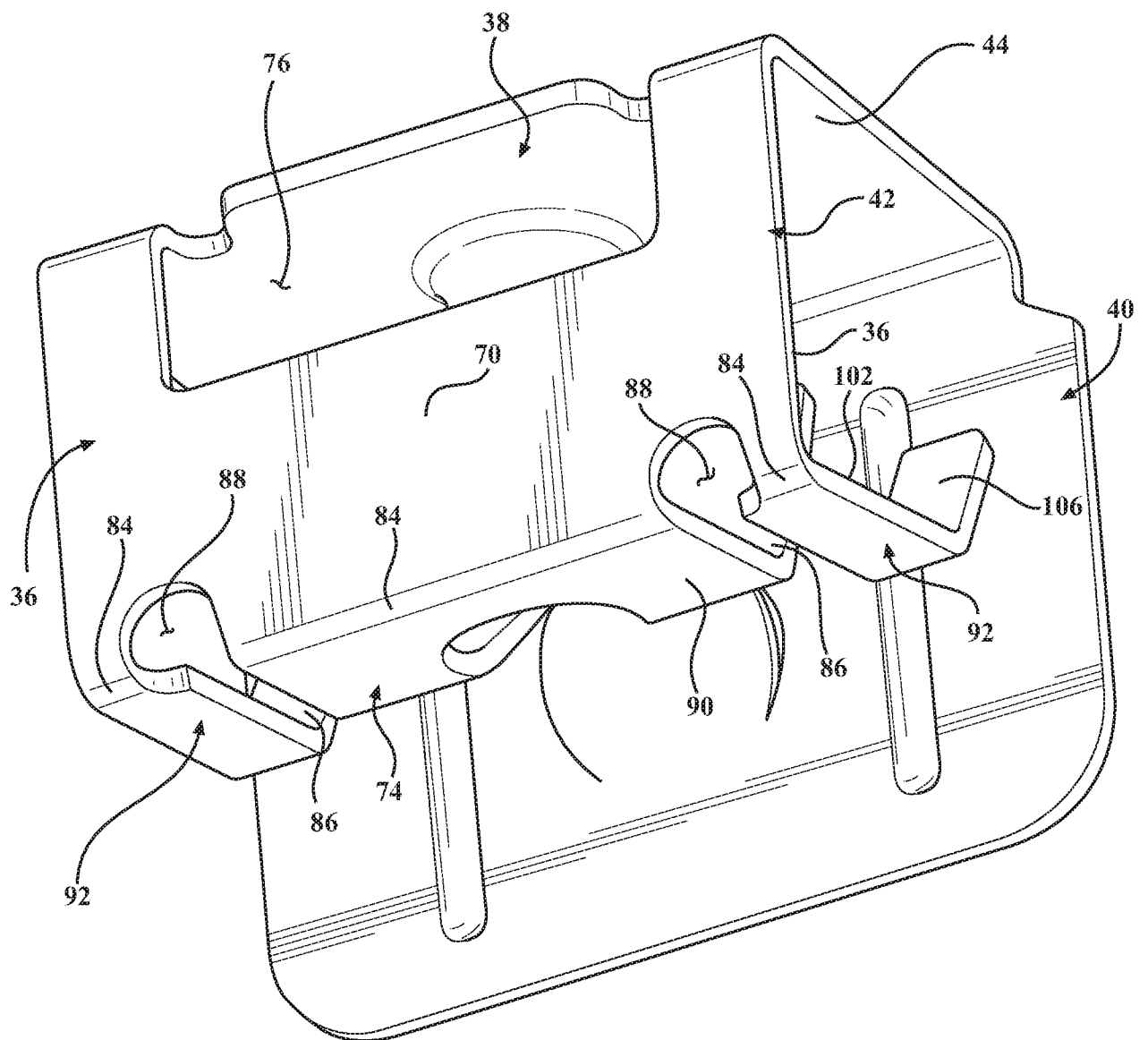


FIG. 5

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2017/000320

A. CLASSIFICATION OF SUBJECT MATTER
INV. F16B5/06
ADD. F16B5/02

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)
F16B

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EP0-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 43 01 975 C1 (DAIMLER BENZ AG [DE]) 7 October 1993 (1993-10-07)	1-4,9-15
Y	column 1, line 60 - column 2, line 42; figure 1	5-8
A	FR 2 898 945 A1 (CAILLAU ETS [FR]) 28 September 2007 (2007-09-28) page 5, line 29 - page 6, line 26; figure 4	1,2,14,15
Y	US 2012/274094 A1 (MAZUR LORIN A [US] ET AL) 1 November 2012 (2012-11-01)	5-8
A	paragraph [0015]; figures 1,3	1,13,14

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Further documents are listed in the continuation of Box C.

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See patent family annex.

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

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"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

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Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2017/000320

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
DE 4301975	C1	07-10-1993	NONE	

FR 2898945	A1	28-09-2007	NONE	

US 2012274094	A1	01-11-2012	CN 102756633 A	31-10-2012
			DE 102012206695 A1	31-10-2012
			US 2012274094 A1	01-11-2012
