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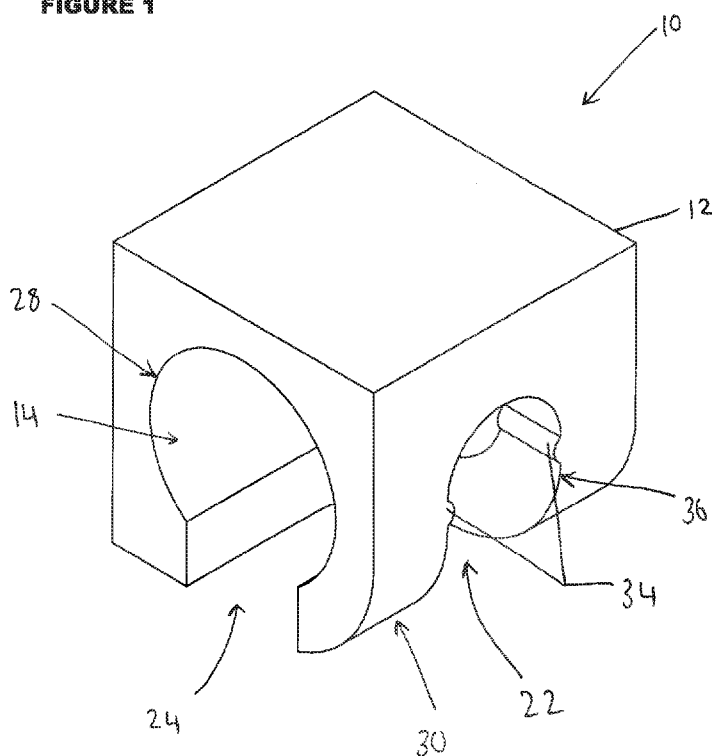
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(54) Title: A MOUNTING DEVICE

FIGURE 1



(57) Abstract: According to the invention there is provided a mounting device (10) for mounting an object on a tow bar (18) which includes a body (12), an inlet (14) defined in the body (12) for allowing a tow ball (16) of a tow bar (18) and a portion of a stem (20) of the tow bar (18) to be introduced into the body (12) and a guide formation (22) defined in the body (12) which extends from a stem receiving portion (24) of the inlet (14) which describes a tortuous path for the stem (20) to follow between a receiving condition wherein the tow bar (18) is introduced into the body (12) and a mounted condition, wherein the body (12) is manoeuvred from the receiving condition along the tortuous path to a position where it is held in position relative to the tow bar (18) so as to inhibit removal of the body (12) from the tow bar (18).

A MOUNTING DEVICE

FIELD OF THE INVENTION

The invention relates to a mounting device for mounting an object on a tow
5 bar, more particularly, for mounting a bicycle carrier on a tow bar.

SUMMARY OF INVENTION

According to the invention there is provided a mounting device for mounting
an object on a tow bar which includes: -

10 a body;

an inlet defined in the body for allowing a tow ball of a tow bar and a portion of
a stem of the tow bar to be introduced into the body; and

a guide formation defined in the body which extends from a stem receiving
portion of the inlet which describes a tortuous path for the stem to follow between a
15 receiving condition wherein the tow bar is introduced into the body and a mounted
condition, wherein the body is manoeuvred from the receiving condition along the
tortuous path to a position where it is held in position relative to the tow bar so as to
inhibit removal of the body from the tow bar.

20 The body may be of any suitable geometric shape, preferably being generally
parallelepipedal. A surface of the body may be of generally arcuate form.

The inlet may include a tow ball receiving portion, typically defining a preferably circular profile for receiving a tow ball of a tow bar complementally therein. The tow ball receiving portion may be arranged centrally the body. The inlet may include a stem receiving portion for receiving, snugly, a portion of a stem of the tow
5 bar therethrough.

The guide formation may be in the form of a channel, which may be arranged to extend substantially orthogonally the stem receiving portion. The channel may include an end wall against which the stem may butt when pivoted towards the
10 mounted condition.

The guide formation may include a retaining formation for retaining the body in the mounted condition relative the tow bar. The retaining formation may be in the form of protruding members which protrude into the channel defined by inner walls of
15 the channel.

The body may be manufactured from any suitable synthetic plastics or metallic material.

20 A connector means may be provided for interconnecting the body and a carrier assembly. The connector means may be in the form of a male-female engaging arrangement on the body and the carrier assembly. The male-female engaging arrangement may comprise a generally elbowed tube, typically square,

which extends from the body and an elongate sleeve of the carrier assembly which may be received coaxially and complementally the tube. A retaining arrangement may be provided for retaining the tube and the sleeve of the carrier assembly in an operative connected condition. The retaining arrangement may include a locking pin
5 which may be received in registering apertures in the tube and the sleeve respectively.

A pivot arrangement may be provided to allow the carrier assembly to be pivoted relative the body to allow the carrier assembly to be displaced between an
10 operative carrying condition and pivoted condition wherein the carrier assembly is pivoted away from the carrying condition to allow a user access to a rear portion of a vehicle.

The carrier assembly may be in the form of a bicycle carrier or a basket.

DETAILED DESCRIPTION OF THE INVENTION

A mounting device in accordance with the invention will now be described by way of non-limiting examples, with reference to the accompanying drawings herebelow.

In the drawings: -

Figures 1 and 2 show schematic views of a mounting device in accordance with the invention;

Figures 3 and 4 show schematic views of the mounting device in a pre-receiving condition and a receiving condition respectively;

Figures 5 shows a schematic view of the mounting device in a mounted condition;

5 Figure 6 shows a schematic view of the mounting device and a portion of a carrier assembly in an operatively connected condition;

Figure 7 is a partially sectioned schematic view of Figure 6; and

Figure 8 is a schematic view of the mounting device and a portion of a carrier assembly in an alternative mounted condition.

10

Referring now to the drawings, a mounting device for mounting an object on a tow bar in accordance with the invention, is generally indicated by reference numeral 10.

15

According to the invention there is provided a mounting device 10 which includes a body 12 having an inlet 14 defined in the body 12 for allowing a tow ball 16 of a tow bar 18 and a portion of a stem 20 of the tow bar 18 to be introduced into the body 12. The mounting device 10 further includes guide formation in the form of a channel 22 defined in the body 12 which extends from a stem receiving portion 24 of the inlet 14 which describes a tortuous path for the stem 20 to follow between a receiving condition (Figure 4) wherein the tow bar 18 is introduced into the body 12 and a mounted condition (Figures 5 to 8), wherein the body 12 is manoeuvred from

20

the receiving condition (Figure 4) along the tortuous path to a position where it is held in position relative to the tow bar 18 so as to inhibit removal of the body 12 from the tow bar 18.

5 The body 12 is generally parallelepipedal in shape. As shown in Figure 2, a surface 30 of the body 12 is of generally arcuate form to encourage or facilitate a smooth displacement of the body 12 relative the tow bar 18.

 The inlet 14 includes a generally circular profiled tow ball receiving portion 28
10 for receiving a tow ball 16 of a tow bar 18 complementally therein. The tow ball receiving portion 28 is arranged centrally the body 12.

 The channel 22 is arranged to extend substantially orthogonally the stem receiving portion 24. The channel 22 includes an end wall 32 against which the stem
15 20 butts when pivoted towards the mounted condition (Figures 5 to 8).

 A retaining means in the form of opposing protruding members 34 which protrude into the channel 22 defined by inner walls 36 of the channel 22 for retaining the body 12 in the mounted condition (Figures 5 to 8) relative to the tow bar 18.

20

 A connector means in the form of a male-female engaging arrangement 42 comprising an elbowed square tube 44 which extends from the body 12 and an elongate sleeve 46 (Figures 6 and 7) of a carrier assembly (not shown) which

receives coaxially and complementally the tube 44, is provided for interconnecting the body 12 and a carrier assembly (not shown). As shown in Figures 6 and 7, a retaining arrangement 48 is provided for retaining the tube 44 and the sleeve 46 of the carrier assembly in an operative connected condition. The retaining arrangement
5 48 includes a locking pin 50 which is received in registering holes 52 in the tube 44 and the sleeve 46, respectively.

A pivot arrangement (not shown) is provided to allow the carrier assembly (not shown) to be pivoted relative the body 12 to allow the carrier assembly (not shown) to be displaced between an operative carrying condition (not shown) and a pivoted
10 condition (not shown) when the carrier assembly (not shown) is pivoted away from the carrying condition to allow a user access to a rear portion of a vehicle.

In use, the body 12 is first lined up in a pre-receiving condition (as shown in
15 Figure 3) wherein the tow ball 16 is introduced into the body 12 via the inlet 14. Once the tow ball 16 and stem 20 are centrally arranged the body 12 (as shown in Figure 4), the body 12 is pivoted in the direction of arrow 38 to allow the stem 20 portion of the tow bar 18 to follow the tortuous path defined by the channel 22 towards the end wall 32 of the channel 22 whereby the stem 20 butts against the end wall 32 when
20 the body 12 (as shown in Figure 5). As shown in Figures 5 and 8, the body 12 may be pivoted a second time in the direction of arrow 40 to allow the elbow 44 to be aligned with the stem 20 of the tow bar 18 and to space the carrier assembly (not shown) further from the rear of the vehicle (not shown).

Although only certain embodiments of the invention have been described herein, it will be understood by any person skilled in the art that other modifications, variations, and possibilities of the invention are possible. Such modifications, variations and possibilities are therefore to be considered as falling within the spirit
5 and scope of the invention and hence form part of the invention as herein described and/or exemplified. It is further to be understood that the examples are provided for illustrating the invention further and to assist a person skilled in the art with understanding the invention and is not meant to be construed as unduly limiting the reasonable scope of the invention.

10

The inventor regards it as an advantage that the invention provides an elegant solution for mounting a bicycle carrier on a tow bar of a vehicle by obviating the need to use additional parts, such as screws and bolts, to mount the bicycle carrier on a tow bar.

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CLAIMS

1. A mounting device for mounting an object on a tow bar which includes: -

a body;

an inlet defined in the body for allowing a tow ball of a tow bar and a portion

5 of a stem of the tow bar to be introduced into the body; and

a guide formation defined in the body which extends from a stem receiving portion of the inlet which describes a tortuous path for the stem to follow between a receiving condition wherein the tow bar is introduced into the body, and a mounted condition wherein the body is manoeuvred from the receiving condition along the
10 tortuous path to a position where it is held in position relative to the tow bar so as to inhibit removal of the body from the tow bar.

2. A mounting device as claimed in claim 1 wherein the body is of any suitable geometric shape.

15

3. A mounting device as claimed in any one of the claims 1 or 2 wherein the body is generally parallelepipedal in shape.

4. A mounting device as claimed in any one or more of the preceding claims
20 wherein a surface of the body is of generally arcuate form.

5. A mounting device as claimed in any one or more of the preceding claims wherein the inlet includes a tow ball receiving portion.

25 6. A mounting device as claimed in claim 5 wherein the tow ball receiving portion defines a circular profile for receiving a tow ball of a tow bar complementally therein.

7. A mounting device as claimed in claim 5 or 6 wherein the tow ball receiving portion is arranged centrally the body.

8. A mounting device as claimed in any one or more of the claims 5 to 7 wherein the inlet includes a stem receiving portion for receiving, snugly, a portion of a stem of the tow bar therethrough.

5 9. A mounting device as claimed in any one or more of the preceding claims wherein the guide formation is in the form of a channel.

10. A mounting device as claimed in claim 9 wherein the channel is arranged to
10 extend substantially orthogonally the stem receiving portion.

11. A mounting device as claimed in claim 9 or 10 wherein the channel includes an end wall against which the stem butts when pivoted towards the mounted condition.

15 12. A mounting device as claimed in any one or more of the claims 9 to 11 wherein the guide formation includes a retaining formation for retaining the body in the mounted condition relative the tow bar.

20 13. A mounting device as claimed in claim 12 wherein the retaining formation is in the form of protruding members which protrude into the channel defined by inner walls of the channel.

14. A mounting device as claimed in any one or more of the preceding claims
25 wherein the body is manufactured from any suitable synthetic plastics material.

15. A mounting device as claimed in any one or more of the preceding claims wherein the body is manufactured from a suitable metallic material.

16. A mounting device which further includes a connector means for interconnecting the body and a carrier assembly.

17. A mounting device as claimed in claim 16 wherein the connector means is in the form of a male-female engaging arrangement on the body and the carrier assembly.

18. A mounting device as claimed in claim 16 or 17 wherein the male-female engaging arrangement comprises a tube which extends from the body and an elongate sleeve of the carrier assembly.

19. A mounting device as claimed in any one or more of the claims 16 to 18 wherein the sleeve of the carrier assembly is received coaxially and complementally the tube.

20. A mounting device as claimed in any one or more of the claims 16 to 19 wherein the tube is generally elbowed.

21. A mounting device as claimed in any one or more of the claims 16 to 20 wherein the tube is square.

22. A mounting device as claimed in any one or more of the claims 16 to 21 wherein a retaining arrangement is provided for retaining the tube and the sleeve of the carrier assembly in an operative connected condition.

23. A mounting device as claimed in claim 22 wherein the retaining arrangement includes a locking pin.

24. A mounting device as claimed in claim 23 wherein the locking pin is received in registering apertures in the tube and sleeve respectively.

25. A mounting device as claimed in any one or more of the preceding claims wherein a pivot arrangement is provided to allow the carrier assembly to be pivoted relative the body to allow the carrier assembly to be displaced between an operative carrying condition and pivoted condition wherein the carrier assembly is pivoted away from the carrying condition to allow a user access to a rear portion of the vehicle.

26. A mounting device as claimed in any one or more of the preceding claims wherein the carrier assembly is in the form of a bicycle carrier.

27. A mounting device as claimed in any one or more of the preceding claims wherein the carrier assembly is in the form of a basket.

28. A mounting device, according to the invention, substantially as hereinbefore described or exemplified.

29. A mounting device, as specifically described with reference to or as illustrated in any one of the accompanying drawings.

30. A mounting device, including any new or inventive integer or combination of integers, substantially as hereinbefore described.

FIGURE 1

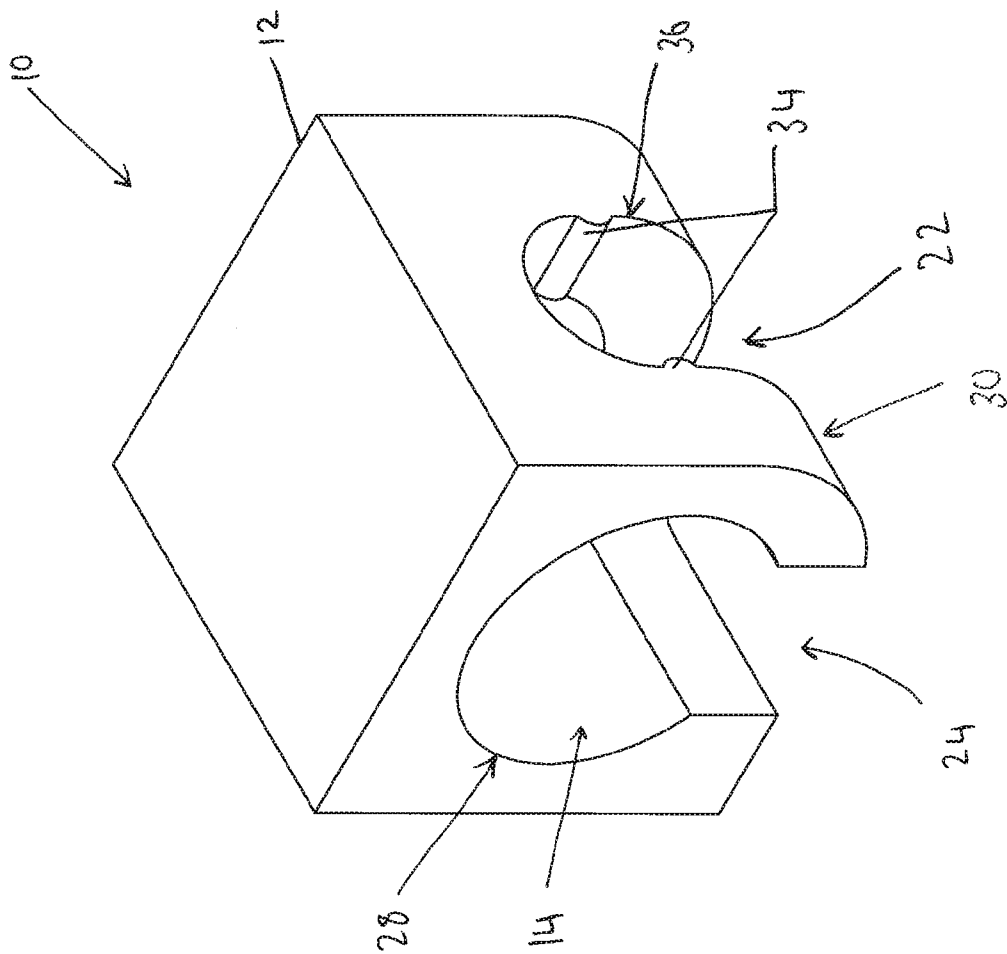
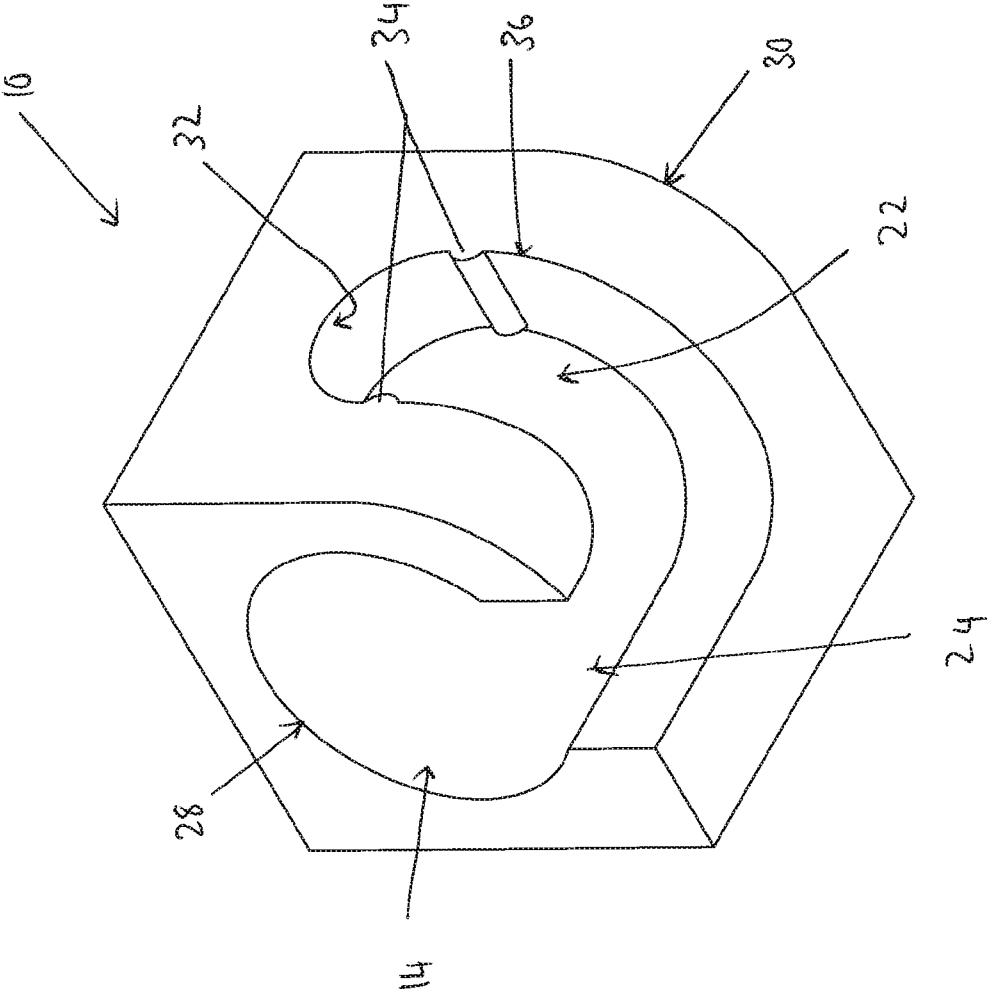


FIGURE 2



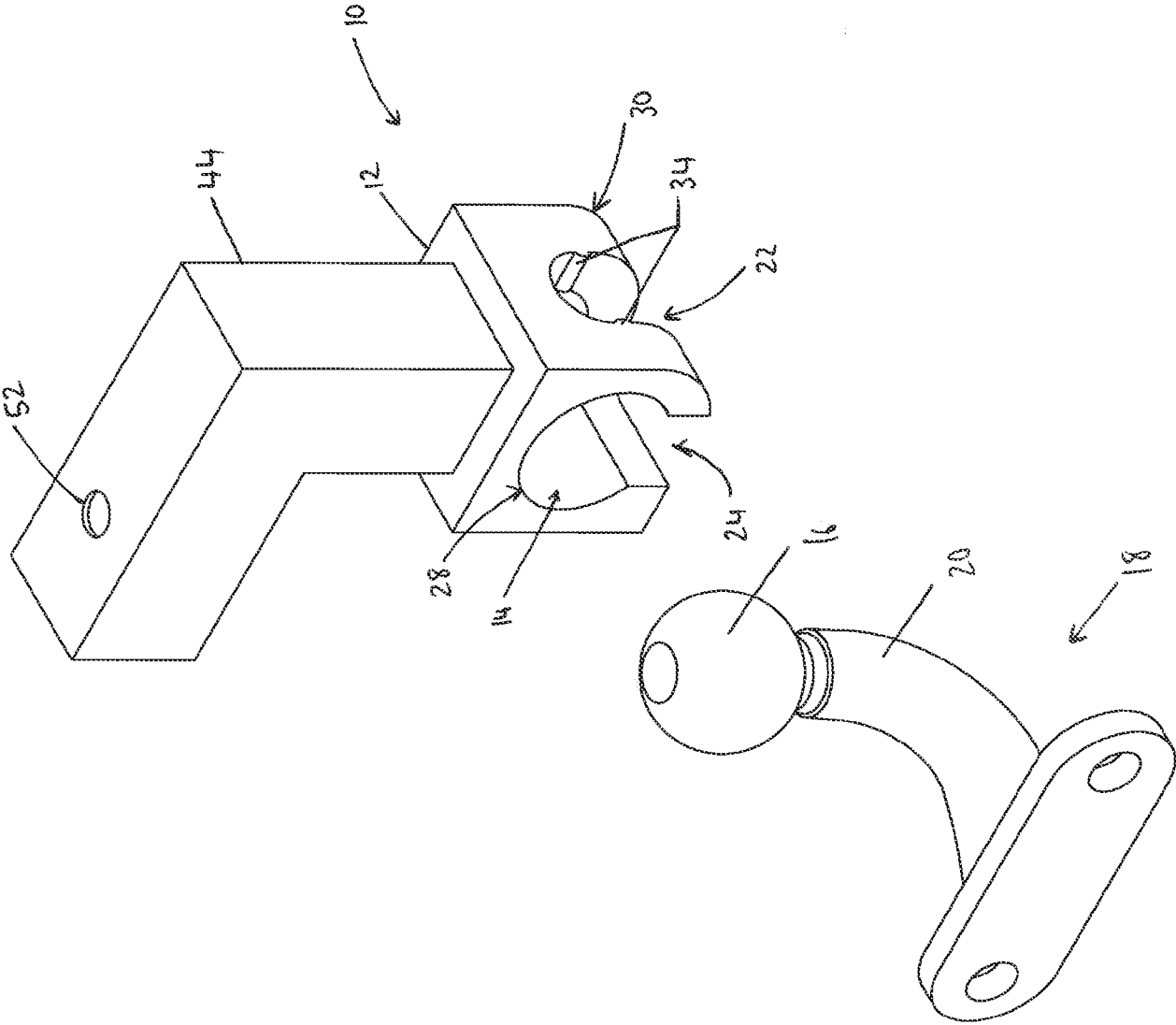


FIGURE 3

FIGURE 4

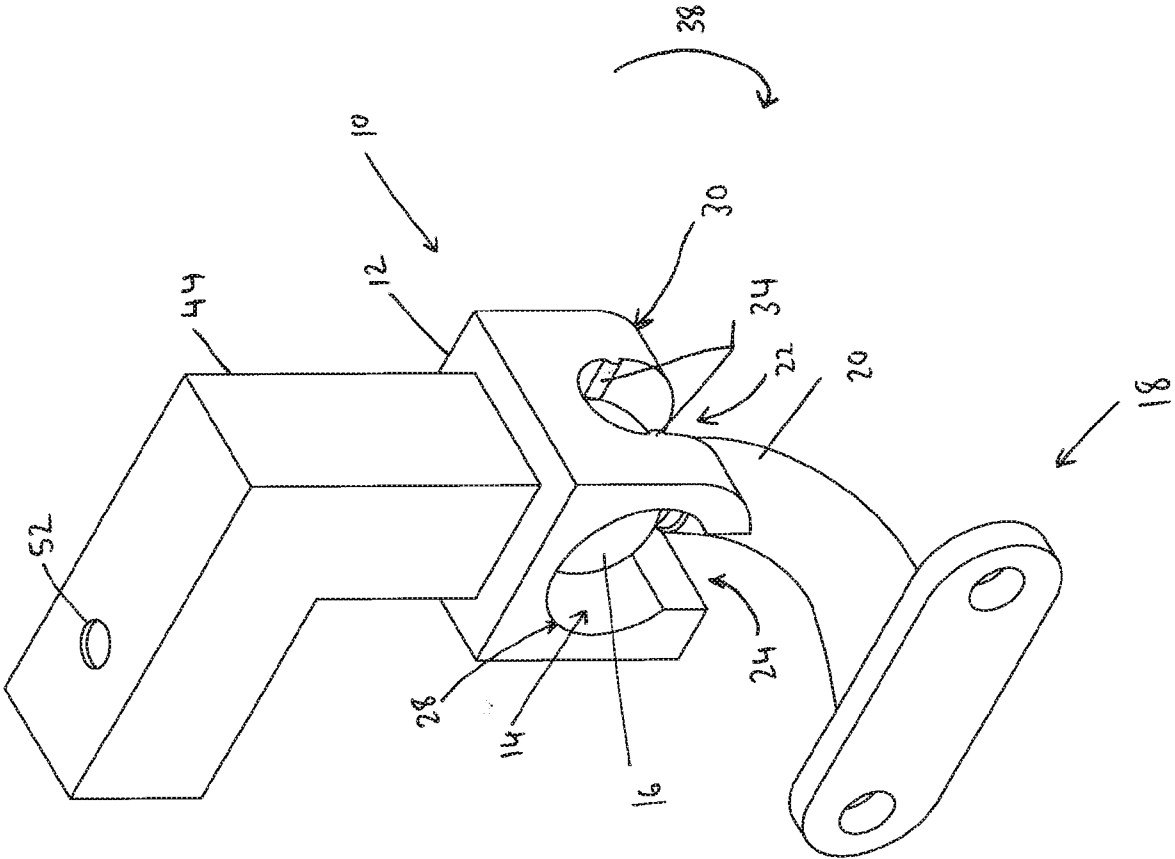


FIGURE 5

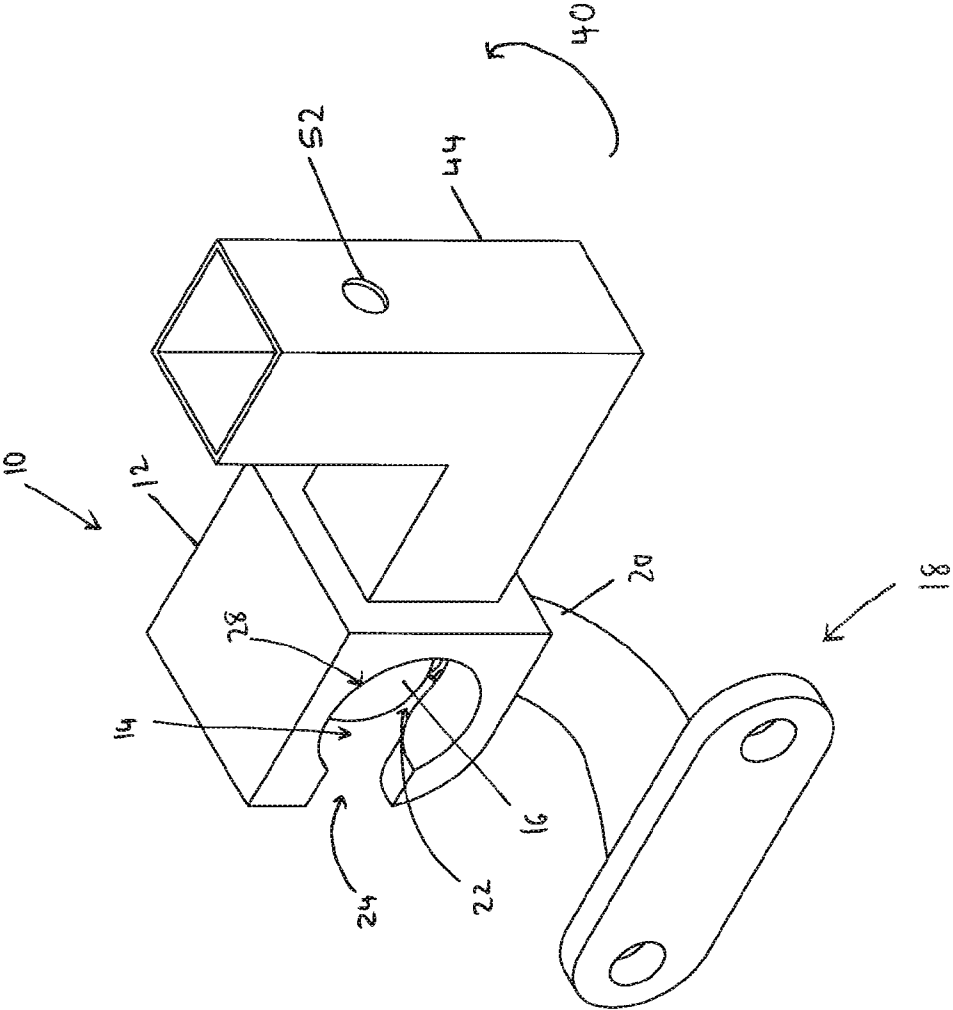


FIGURE 6

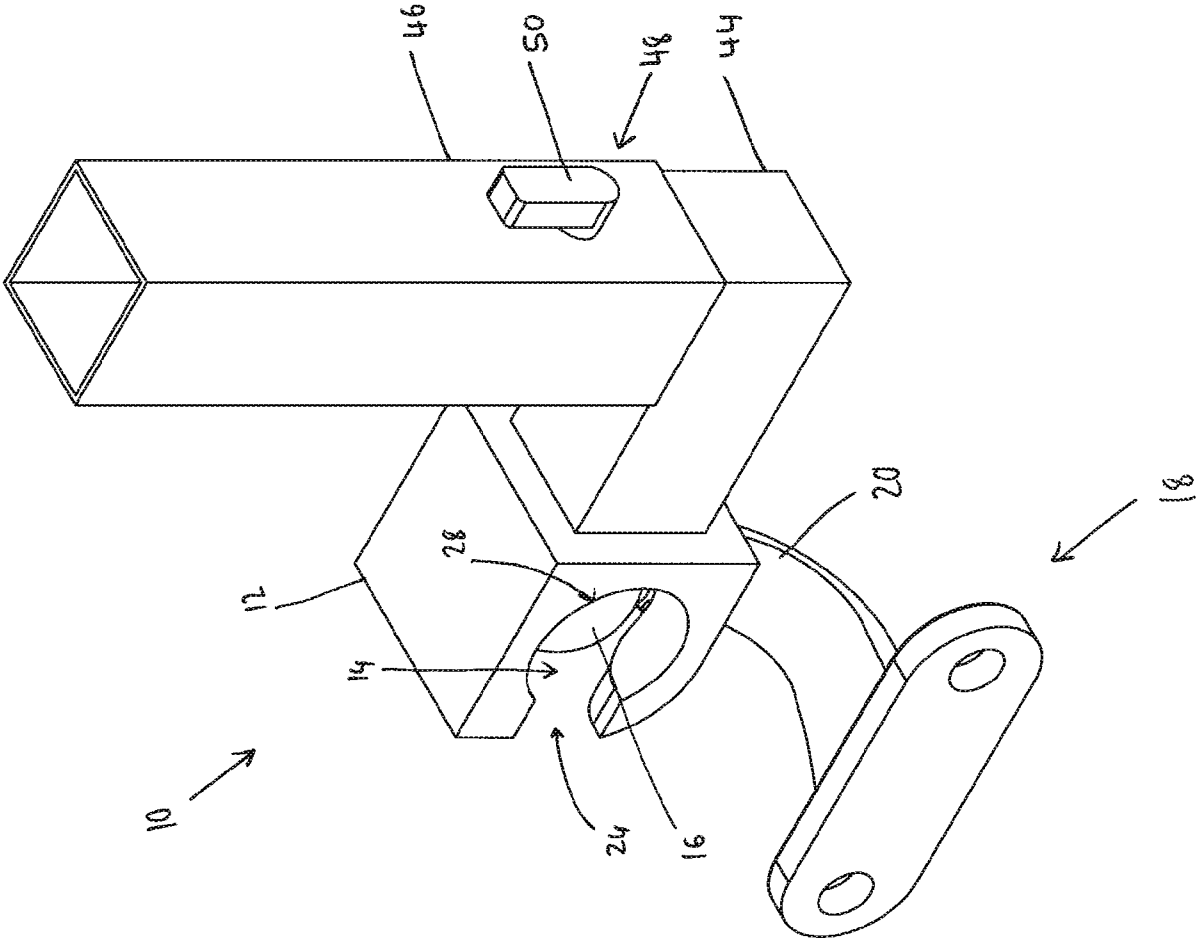
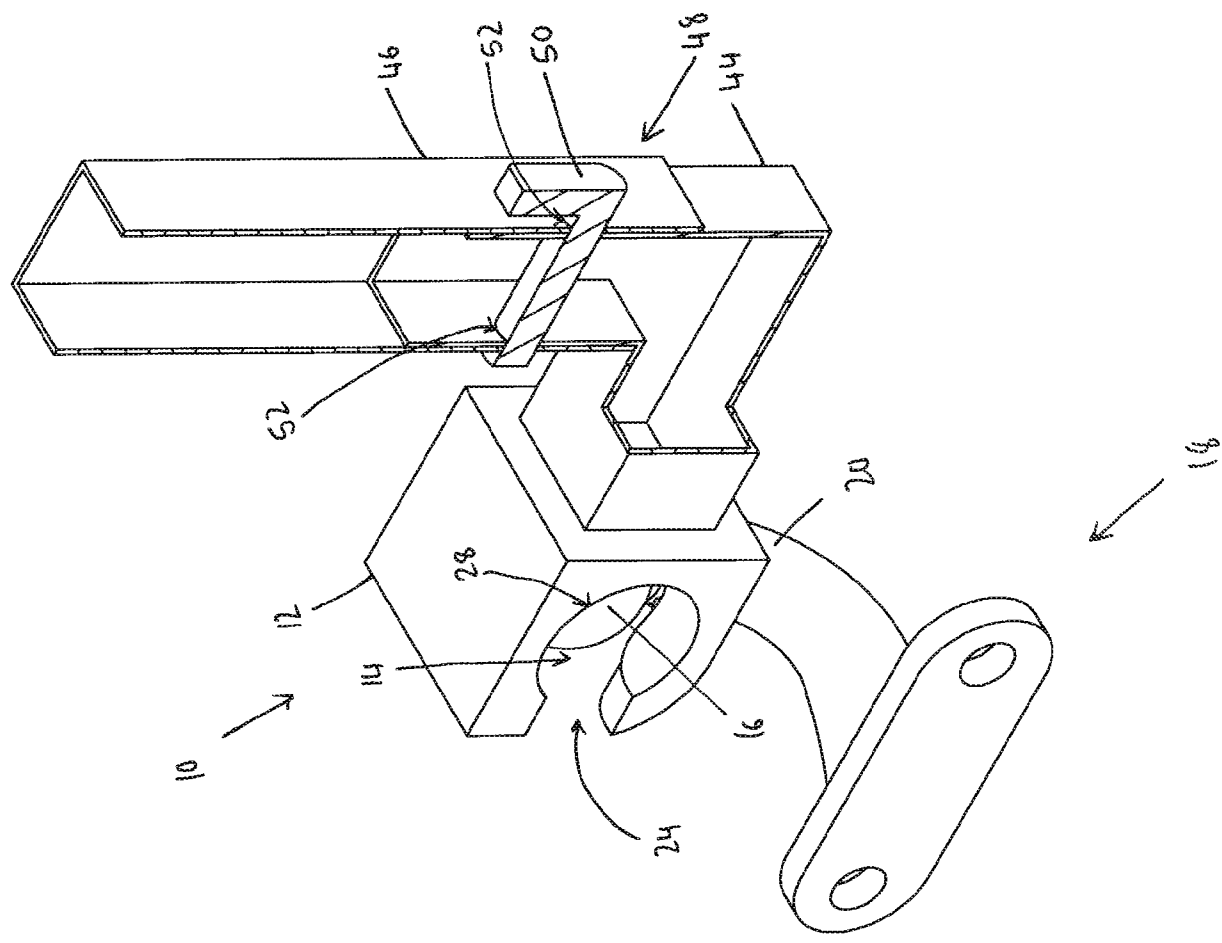


FIGURE 7



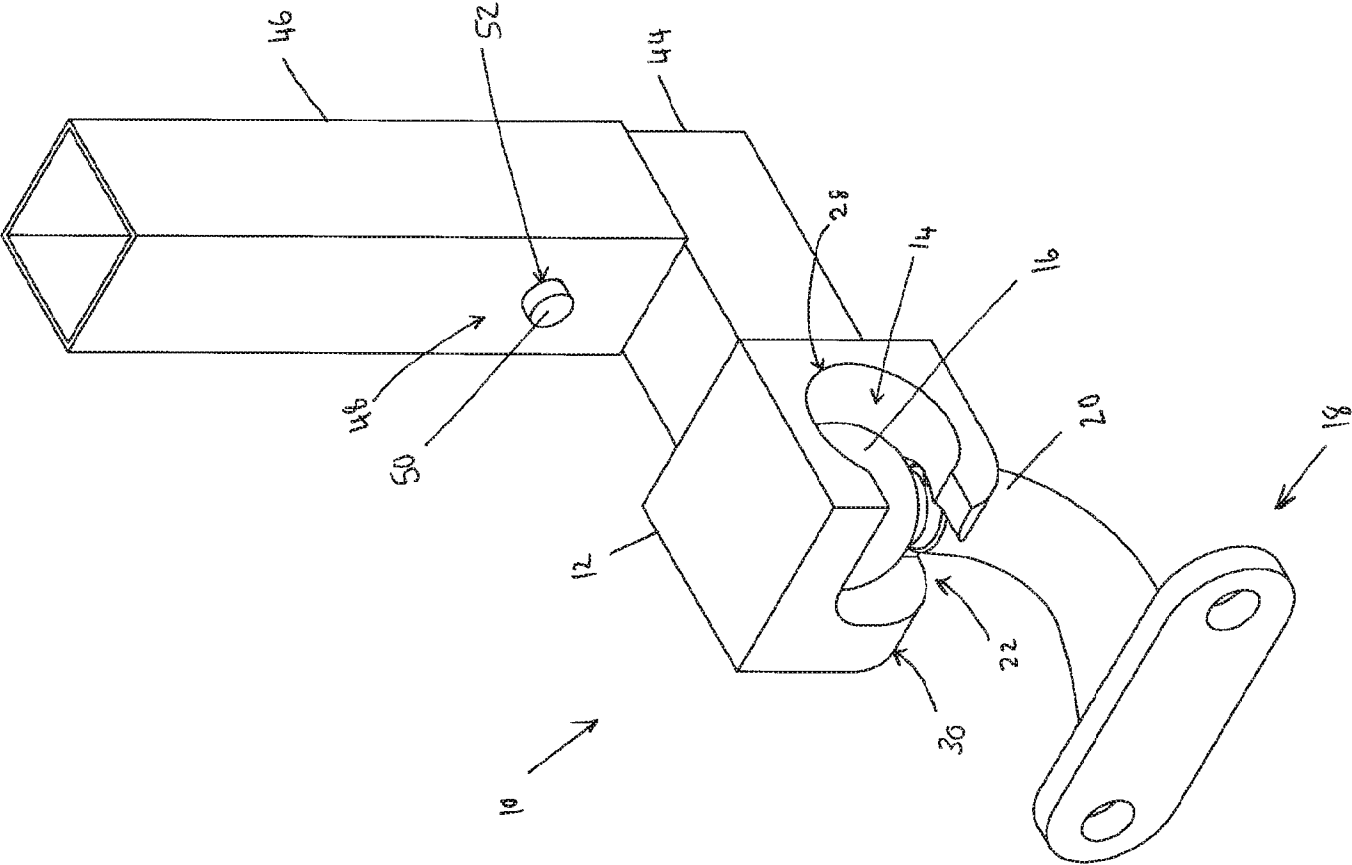


FIGURE 8

INTERNATIONAL SEARCH REPORT

International application No.

PCT / ZA 2017/050013

A. CLASSIFICATION OF SUBJECT MATTER IPC: B60R 9/08 (2006.01); B60R 9/06 (2006.01); B60R 9/10 (2006.01); F16C 11/06 (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) B60R, F16C 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) WPI; EPODOC; TXTnn		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 204472705 U (NINGBO CHENFAN AUTO ACCESSORIES CO., LTD) 15 July 2015 (15.07.2015) figures	1-27
A	FR 2750376 A1 (BOSAL THORIGNY SUR MARNE BTM) 02 January 1998 (02.01.1998) figures	1-27
A	DE 102009050139 A1 (CARL STAHL GMBH) 21 April 2011 (21.04.2011) figures	1-27
A	DE 19835949 A1 (PREH-WERKE GMBH & CO. KG) 17 February 2000 (17.02.2000) figures	1-27
A	EP 1477690 A2 (STABILUS GMBH) 17 November 2004 (17.11.2004) figures	1-27
☒ Further documents are listed in the continuation of Box C. ☒ 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 15 May 2017 (15.05.2017)		Date of mailing of the international search report 19 May 2017 (19.05.2017)
Name and mailing address of the ISA/AT Austrian Patent Office Dresdner Straße 87, A-1200 Vienna Facsimile No. +43 / 1 / 534 24-535		Authorized officer WAGNER S. Telephone No. +43 / 1 / 534 24-381

INTERNATIONAL SEARCH REPORT

International application No.

PCT / ZA 2017/050013

C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5147386 A (CARIGNAN ET AL.) 15 September 1992 (15.09.1992) figures	1-27
A	DE 102006020103 A1 (STABILUS GMBH) 31 October 2007 (31.10.2007) figures	1-27

INTERNATIONAL SEARCH REPORT

International application No.

PCT / ZA 2017/050013

Box No. II	Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)
This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons: 1. ☐ Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely: 2. ☒ Claims Nos.: 28 - 30. because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically: Referring to 28 and 30: According to PCT-Rule 6.3(a), claims shall be in terms of the technical features of the invention. Claims 28 and 30 do not contain any technical features and are therefore not allowed. Referring to claim 29: According to PCT-Rule 6.2(a), claims shall not rely on such references "as illustrated in figure ... of the drawings", therefore claim is not allowed. 3. ☐ Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).	
Box No. III	Observations where unity of invention is lacking (Continuation of item 3 of first sheet)
This International Searching Authority found multiple inventions in this international application, as follows: 1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims. 2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees. 3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.: 4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: Remark on Protest ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee. ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation. ☐ No protest accompanied the payment of additional search fees.	

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT / ZA 2017/050013

Patent document cited in search report			Patent family member(s)			Publication date
CN	U	204472705	CN	U	204472705	2015-07-15
FR	A1	2750376	FR	A1	2750376	1998-01-02
DE	A1	102009050139	EP	A1	2490974	2012-08-29
			WO	A1	2011047830	2011-04-28
			DE	A1	102009050139	2011-04-21
DE	A1	19835949	EP	A1	0980984	2000-02-23
			DE	A1	19835949	2000-02-17
EP	A2	1477690	EP	A2	1477690	2004-11-17
			DE	A1	10322265	2004-12-09
			US	A1	2005013658	2005-01-20
			US	A1	2008199248	2008-08-21
US	A	5147386	US	A	5147386	1992-09-15
DE	A1	102006020103	JP	A	2007298173	2007-11-15
			US	A1	2007253765	2007-11-01
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