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(54) **COMBINATION EQUIPMENT CARRIER FOR AUTOMOBILES**

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B60R 9/08	(2006.01)
B60R 9/06	(2006.01)
B60R 9/12	(2006.01)

(52) **U.S. Cl.**
CPC ***B60R 9/08*** (2013.01); ***B60R 9/06*** (2013.01); ***B60R 9/10*** (2013.01); ***B60R 9/12*** (2013.01)

(58) **Field of Classification Search**
CPC B60R 9/06; B60R 9/08; B60R 9/10
USPC 224/523, 532, 536, 924
See application file for complete search history.

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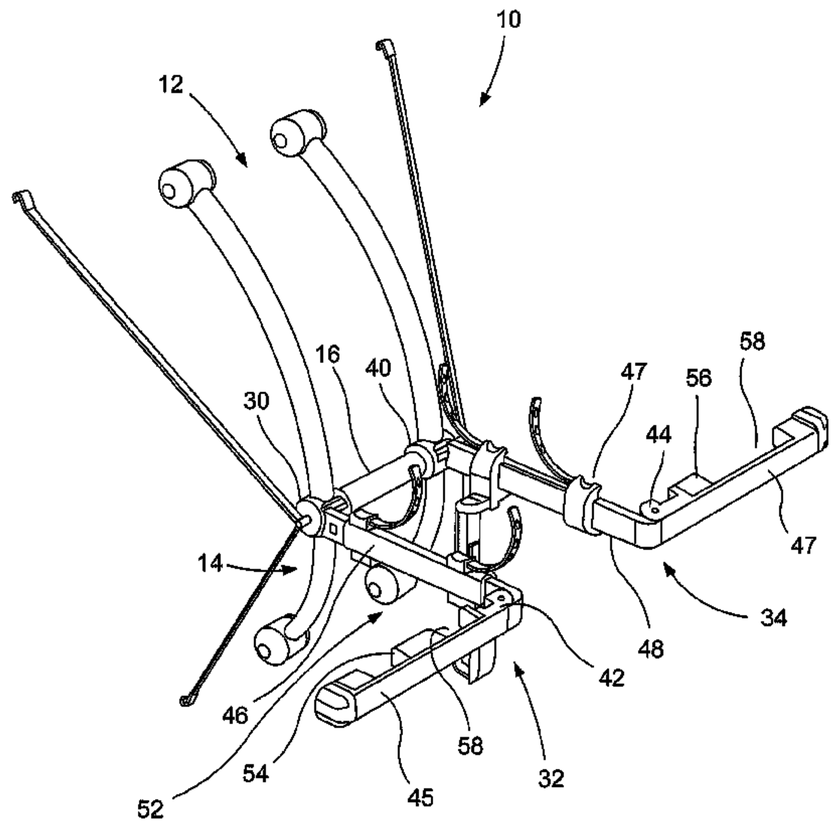
(57) **ABSTRACT**

A combination carrier adapted to be mounted at a rear of a vehicle consists of an upper frame and a lower frame interconnected by a transverse connecting element. The upper frame is formed by first and second upper arms. The lower frame is formed by first and second lower arms. The first upper arm, the first lower arm; the second upper arm and the second lower arm are pivotably connected to each other at respective first and second hubs. A proximal support assembly is movably arranged at the first hub at the junction between the first upper arm and the first lower arm. The distal support assembly is movably arranged at the second hub at the junction between the second upper arm and the second lower arm.

16 Claims, 8 Drawing Sheets



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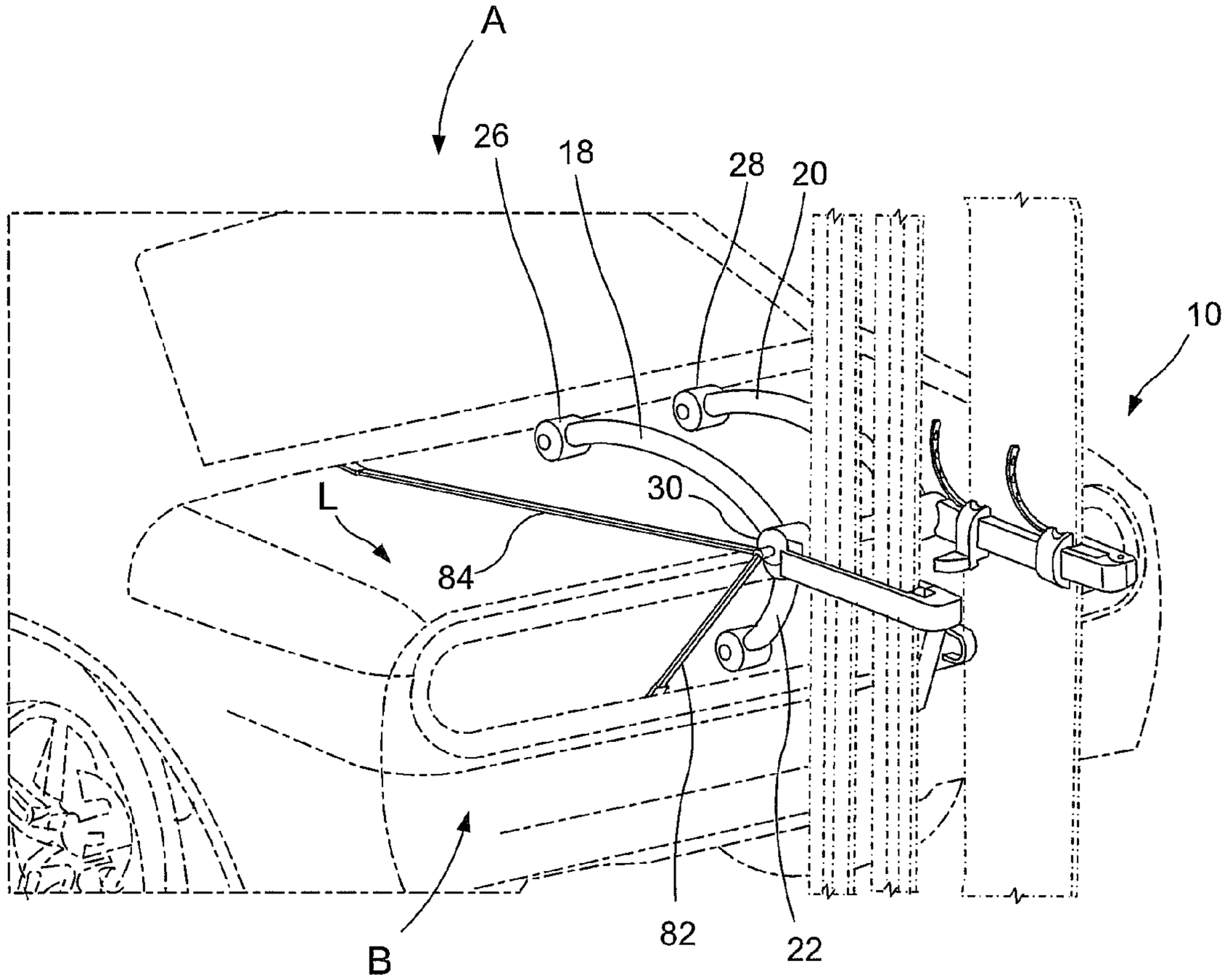
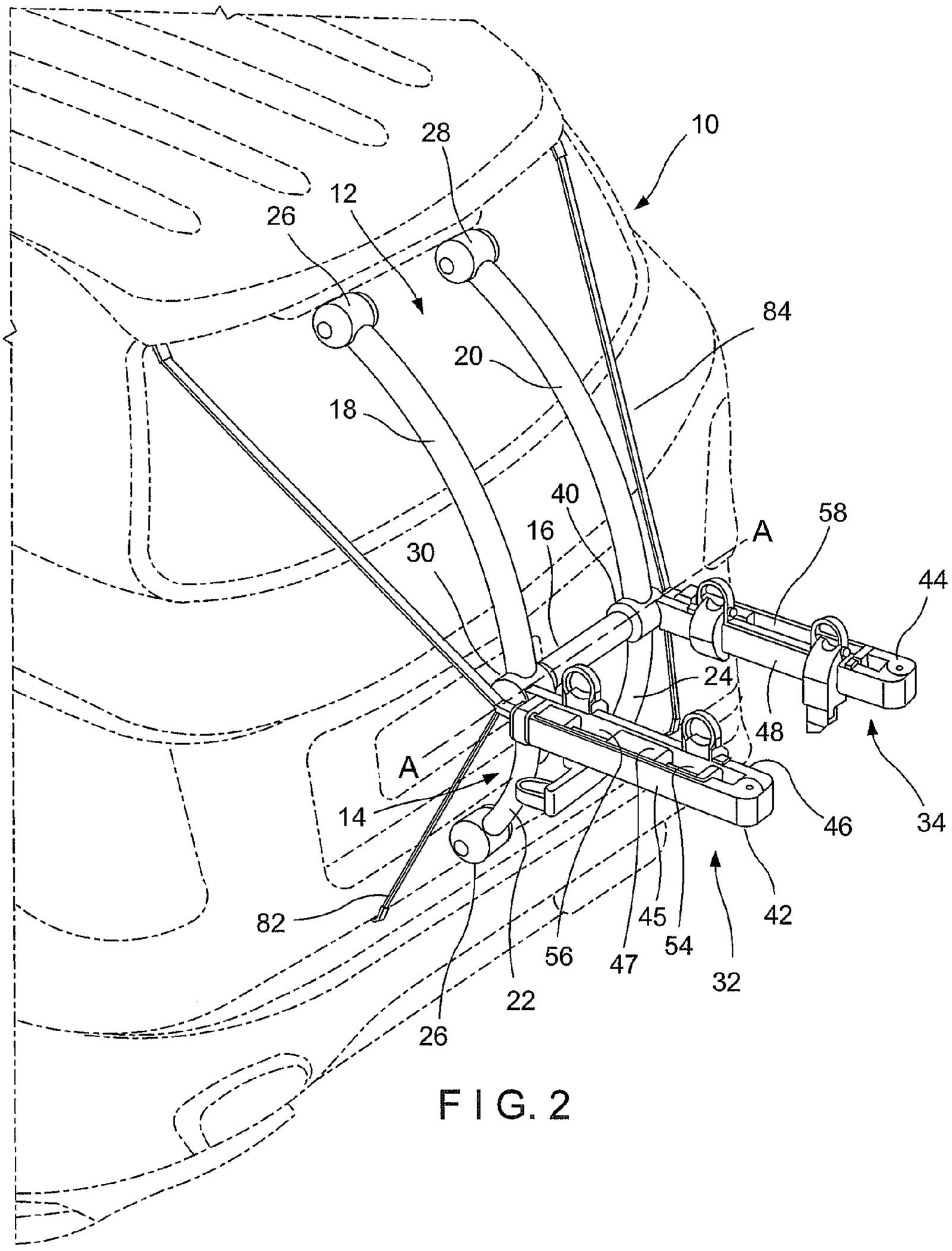


FIG. 1


10
28
12
26
84
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82
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FIG. 2

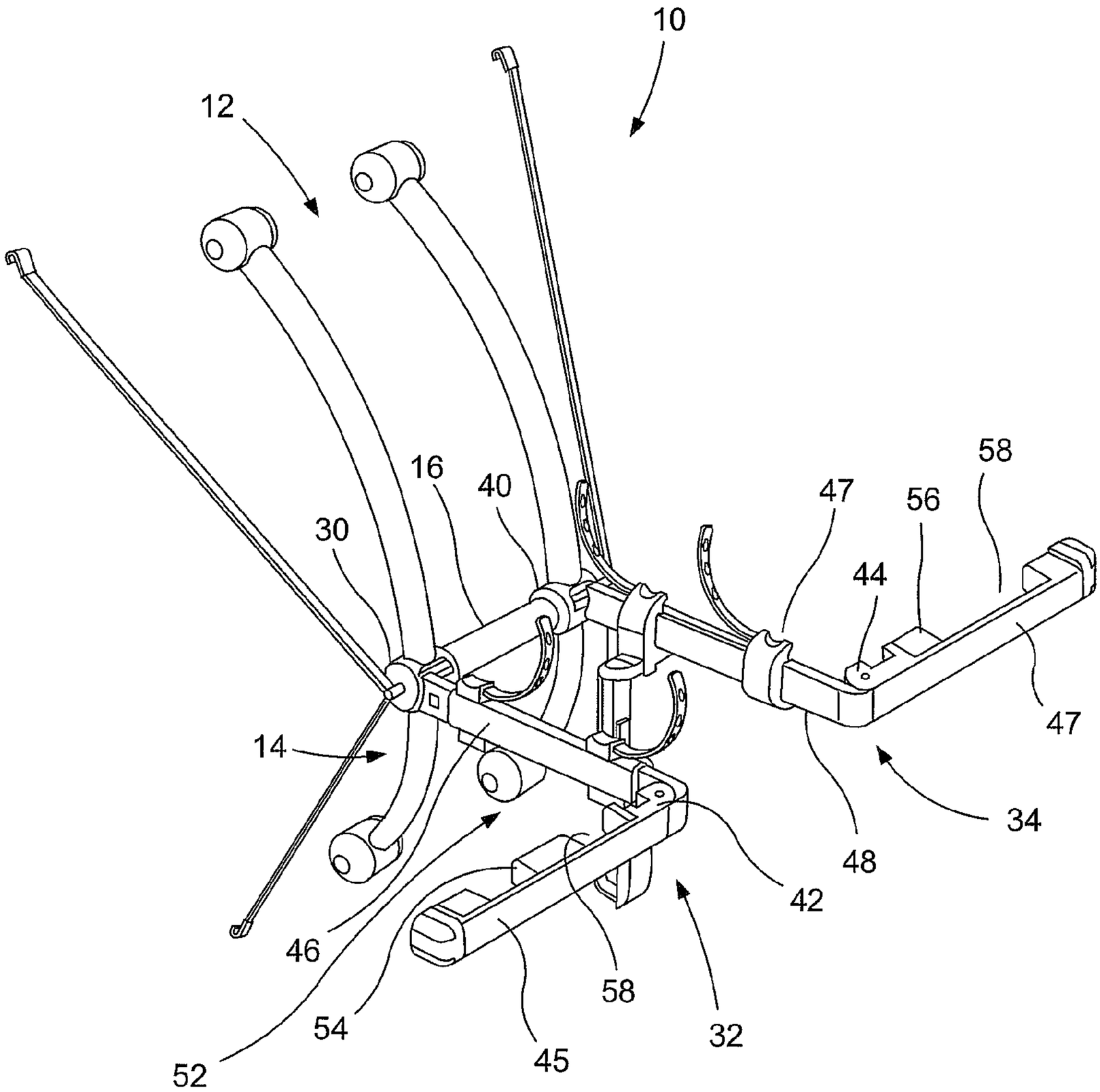

FIG. 3

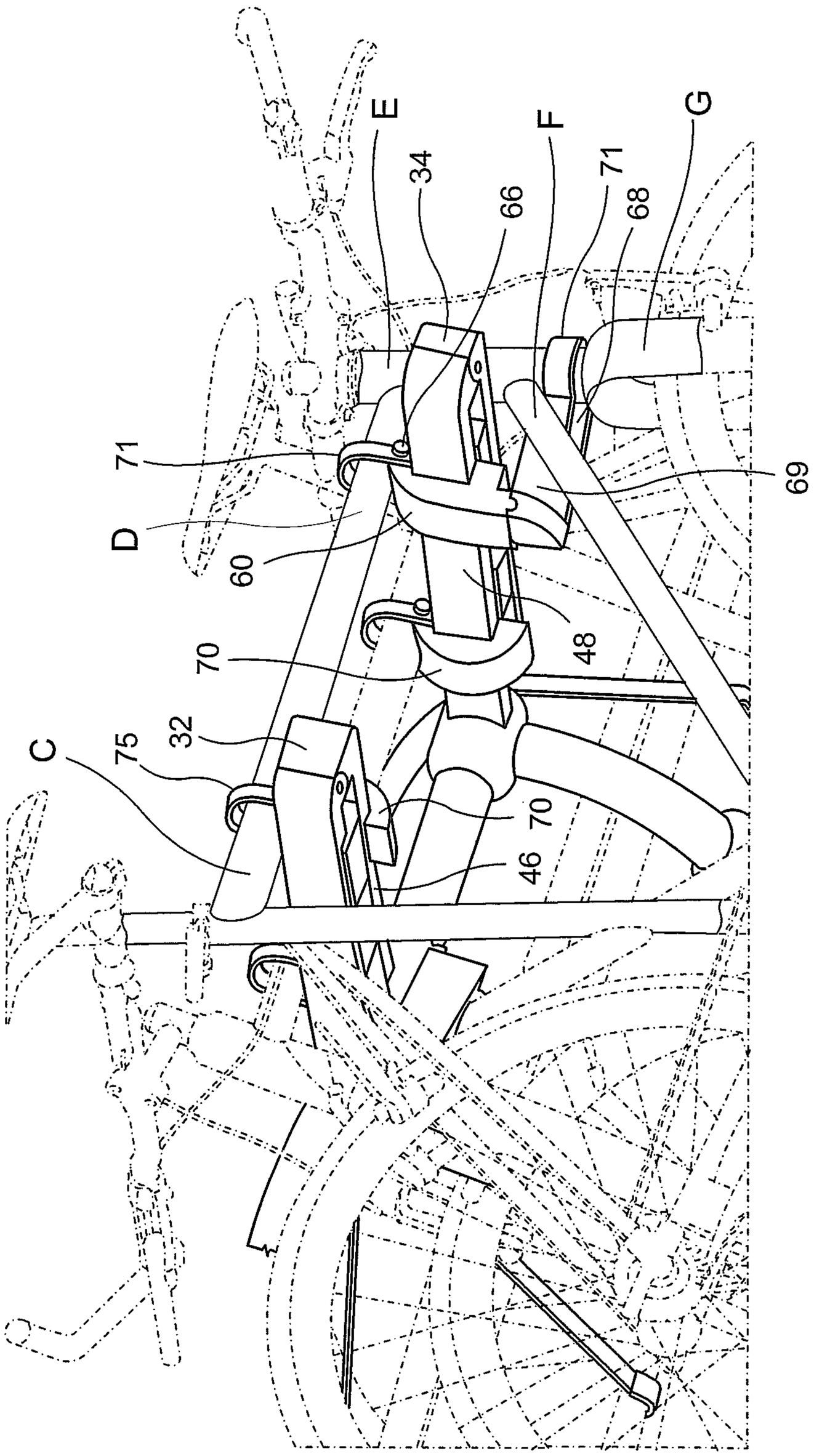

FIG. 4

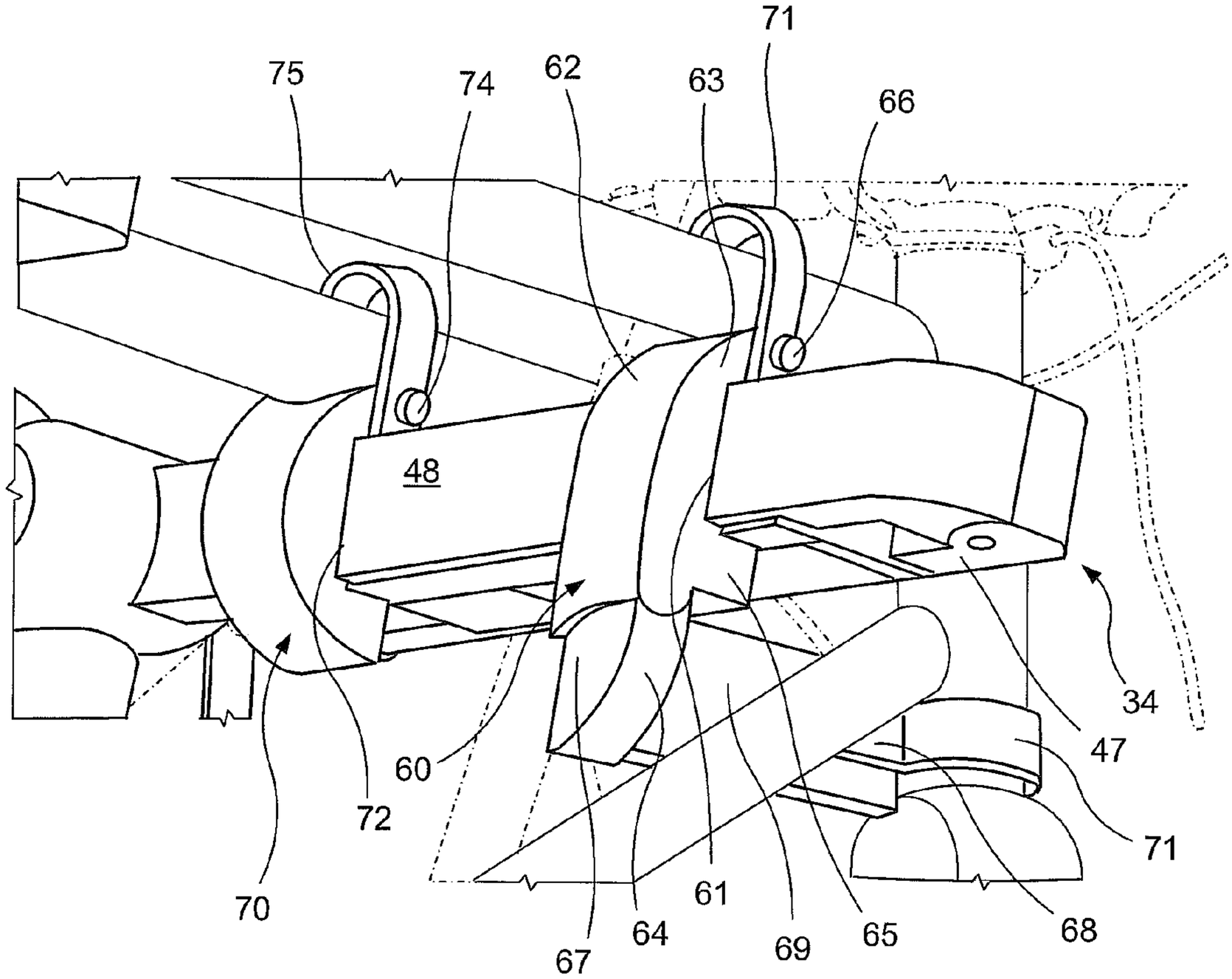

FIG. 5

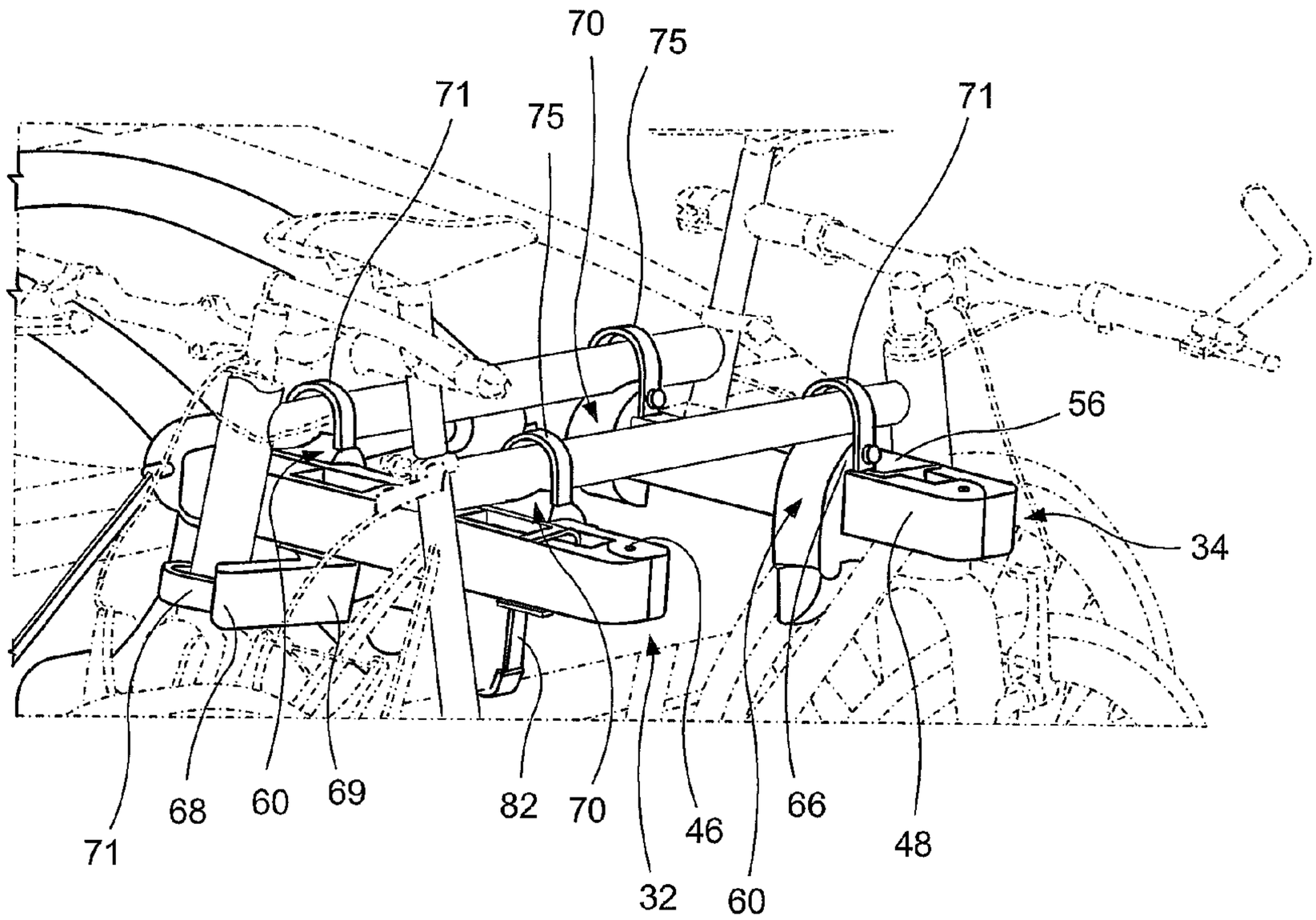

FIG. 6

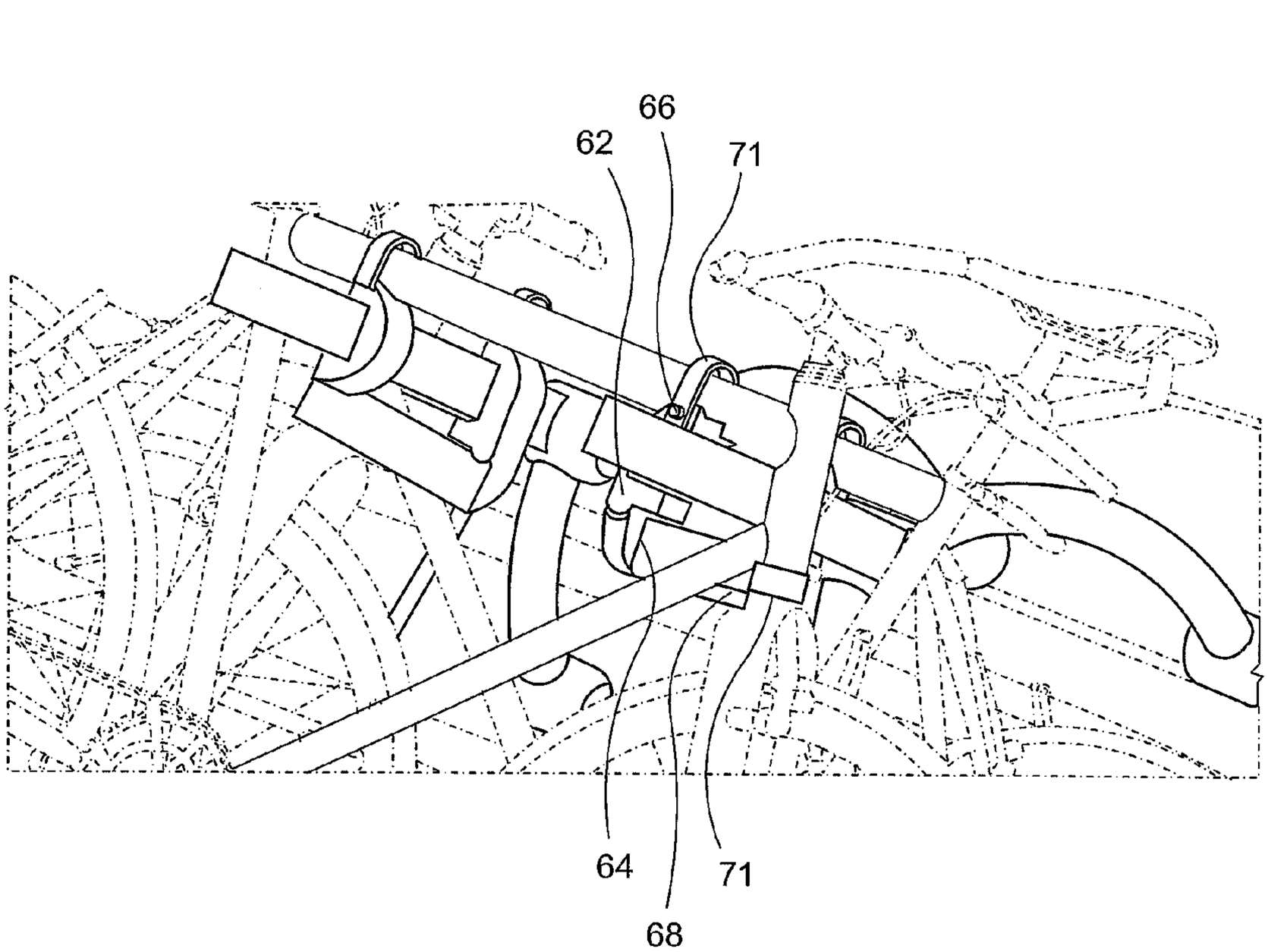

FIG. 7

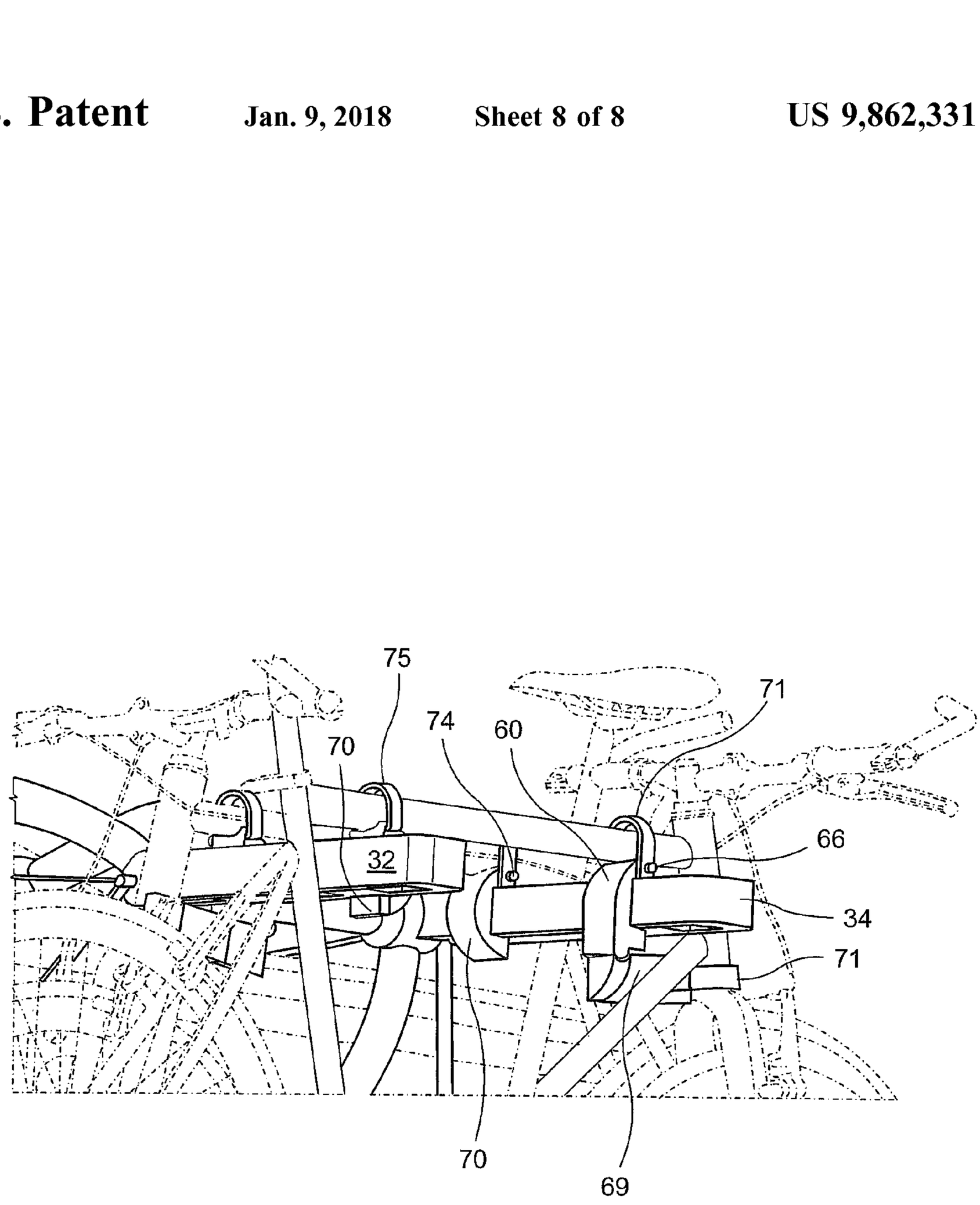

FIG. 8

COMBINATION EQUIPMENT CARRIER FOR AUTOMOBILES

REFERENCE TO RELATED APPLICATION

This Application claims priority of U.S. Provisional Application Ser. No. 62/065,520 filed by the inventors on Oct. 17, 2014, the entire disclosure of which is hereby incorporated by reference.

FIELD OF THE INVENTION

The present invention relates to the field of carriers for attachment to exterior of automobiles and more specifically it is directed to a combination carrier adapted for removable mounting to the rear of a vehicle for carrying bicycles or skis and/or snow boards.

BACKGROUND OF THE INVENTION

Recreational equipment, such as skis, snow boards and bicycles, are often transported by a motor vehicle. With the recent growth and development of recreational biking, bicycle riding is not only a means for traveling to a destination, but a recreational goal in itself. The frequent bicyclist finds a routine need for convenient bicycle transport in the family vehicle to bike trails and bike sporting events. Only a limited number of substantial trucks and cars can conveniently accommodate bicycle, snow board or skis in the passenger compartment or trunk, and even then space for luggage and passengers is compromised. To address the need for convenient exterior transportation of skis, snow boards, bicycles, etc., the carrier or transportation rack of the invention has been developed.

SUMMARY OF THE INVENTION

The invention provides a vehicle-mounted equipment carrier enabling a user to mount one or more items of equipment, such as bicycles, skis, snowboards, etc., to a vehicle for transportation purposes. The invention is formed to accommodate a desire of the user to tailor the configuration of the carrier according to the type of vehicle to which the carrier is to be mounted. The equipment carrier of the invention includes at least the following embodiments: a trunk or rear-mounted embodiment, hitch-mounted embodiment, etc. The invention provides a carrier arrangement in which both the configuration of the frame as well as the position of the support members can be adjusted according to the configuration of the vehicle.

It is an object of the present invention to provide an equipment carrier in which the configuration of the equipment carrier can be quickly and easily altered according to the configuration of the vehicle to which the equipment carrier is to be mounted.

It is a further object of the invention to provide such an equipment carrier which is movable between various extended position for providing use of the carrier, and an inoperative collapsed position for storage.

Yet another object of the invention is to provide such an equipment carrier having a relatively small number of components, which results in a relatively inexpensive cost of manufacture. In this manner, an equipment carrier which is relatively simple in its components and construction, yet which is capable of being quickly and easily reconfigured for use or moved from one operational position to another.

Yet further object of the invention is to provide an equipment carrier which is mounted over the bumper and on the rear of the trunk lid of an automobile and attached to the vehicle by straps with hook elements at their ends.

In the invention elements of the carrier tend not to interfere with any equipment supported on the carrier frame. Potential scratching or otherwise damage of the automobile, bicycles, etc. is also prevented.

The carrier of the invention offers the convenience and economy of dual-purpose year-around use of the carrier, without the inconvenience and potential damage to bicycles, the skis and automobile. Further, the design of the carrier prevents improper mounting of the equipment to a vehicle, so as to prevent disengagement during road travel, minimizing loss of the equipment and possible accidents and injuries.

The present invention addresses the aforementioned need by providing a combination carrier for carrying equipment such as for example: skies, snow boards and bicycles and adapted for attachment to the exterior of an automobiles. The combination carrier is movable between an extended position in which the equipment is transported, and a retracted position in which the equipment is placed in storage.

BRIEF DESCRIPTION OF THE DRAWINGS

Referring now to the drawings which are provided to illustrate and not to limit the invention, wherein:

FIG. **1** is a perspective view showing an equipment carrier of the invention mounted at a rear part of a sedan;

FIG. **2** is a perspective view of the equipment carrier mounted at the rear end of a sport utility vehicle;

FIG. **3** is another view of the equipment carrier;

FIG. **4** is a view of the equipment carrier adapted for carrying of two bicycles;

FIG. **5** is an enlarged detailed view thereof;

FIG. **6** is another view similar to the view of FIG. **4**;

FIG. **7** is view similar to the view of FIG. **6**; and

FIG. **8** is a further view similar to that of FIG. **6**.

DETAILED DESCRIPTION OF THE INVENTION

Throughout the description, the terms "upper", "lower" "top" and "bottom" are used to describe the normal orientation of the components of the equipment carrier or rack **10** when in use. It is understood, however, that such terms are not intended to be limiting as to the manner in which the carrier **10** may be used. Rather, such terms are used for purposes of convenience in describing and understanding the relationship of the components of carrier **10** when employed in the manner illustrated in the drawings.

With reference to the drawings wherein like numerals indicate like elements, FIG. **4** shows the rear portion of a typical automobile A with a rear bumper B and a trunk lid L.

The combination bicycle/ski carrier or rack of this invention is generally designated by the numeral **10** (see FIGS. **1-3**, for example) and generally includes an upper frame **12** and a lower frame **14** interconnected by a transverse connecting element **16**. A longitudinal axis A-A of the carrier passes through the connecting element **16**. The upper frame **12** consists of spaced from each other first **18** and second **20** upper arms. In a similar fashion, the lower frame **14** consists of spaced from each other first **22** and second **24** lower arms. Each upper and lower arm extends between a connecting

end and a free end thereof. Each arm is preferably tubular in construction and snugly mounted within the open upper or lower ends of the respective hub. The first upper arm **18** and the first lower arm **22** are pivotably connected to each other at a first hub assembly **30**, whereas the second upper arm **20** and the second lower arm **24** are pivotably connected to each other at a second hub assembly **40**. The hub assemblies are also adapted to receive respective ends of the transverse element **16**.

To protect the surface finish of the vehicle against scratching by the carrier **10** resilient shock absorbing members **26** and **28** are mounted at the free ends of the upper and lower arms.

Although curved or arched-shaped configuration of the arms will be discussed with respect to the illustrated embodiments, it should be noted that any conventional configuration of arms is within the scope of the invention.

The arms **18**, **20** of upper frame **12** and the respective shock absorbing members **26**, **28** function to define an upper forward vehicle engagement area of the carrier **10** of the invention, which is adapted to engage an upper area of the vehicle. Similarly the anus **22**, **24** of the lower frame **14** and the respective shock absorbing members **26**, **28** function to define a lower forward vehicle engagement area of the carrier **10** of the invention, which is adapted to engage a lower area of the vehicle.

The hubs **30**, **40** are essential components of the present invention and are configured to movably accommodate the respective upper and lower arms, as well as equipment support assemblies. The proximal support assembly **32** and distal support assembly **34** are movably connected to the respective hubs to mount and support equipment, such as bicycles, skies, snowboards, etc. The proximal support assembly **32** is movably arranged at and extends outwardly from the first hub **30** at an area of junction between the first upper arm **18** and the first lower arm **22**. Similarly, the distal support assembly **34** extends outwardly from the second hub **40** at an area of junction between the second upper arm **28** and the second lower arm **24**.

Each hub is formed with top, bottom, inner and outer regions. The top region of each hub **30**, **40** is provided with an opening adapted for snuggly receiving the connecting end of the respective upper arms **18**, **20**. The bottom regions are also formed with openings for snuggly receiving the connecting ends of the lower arms **22**, **24**. Openings formed in the inner regions of the hubs are provided to fixedly accommodate the respective ends of the connecting element **16**. The engaging ends of the proximal **32** and distal **34** support assemblies are movably/pivotably accommodated at the outer regions of the respective hub. The top and bottom regions of the hubs are movable/pivotable with respect to each other, so as to facilitate pivotable motion of the upper **12** and lower **14** frames about a longitudinal axis A-A of the rack **10** passing through the connecting element **16**.

A controlling/adjustment arrangement is provided in each hub, so as to prevent movement of the upper and lower frames **12** and **14** relative to the longitudinal axis A-A, upon reaching their predetermined angular orientation. In this manner, such predetermined axial orientation of the upper frame **12** relative to the lower frame **14** can be fixed.

The upper ends of each lower arms **22**, **24** are pivotably mounted within the hubs **30**, **40** relative to the lower ends of the upper arms **18**, **20**. In this manner a transverse pivot axis A-A is defined coextensive with the connecting element **16** about which the upper frame **12** and the lower frame **14** are pivotable for movement between one operative position as shown in FIG. **1** and another operative position as shown in FIGS. **2** and **3** and vice versa.

The first hub assembly **30** and the second hub assembly **40** are formed with variable position engagement arrangements which are operable to selectively fix the axial orientation of the upper frame **12** relative to the hubs and thereby relative to the lower frame **14**, when the lower and upper frames are moved to their operative extended and/or retracted positions. The variable position engagement arrangement is engaged, when predetermined angular orientation of the upper and lower frames with respect to each other is achieved. When the desired axial position of the upper frame **12** and the lower frame **14** relative each other has been attained, the user activates the engagement arrangement, so as to prevent accidental movement of the frames. On the other hand, when the upper and lower frames have to be repositioned, the engagement arrangement is deactivated so as to allow pivotal motion as discussed above. In one of the embodiments when activation or deactivation of the engagement arrangements is desired the user grasps upper frame **12** and lower frame **14** and pivots the same away or toward each other.

As best illustrated in at least FIGS. **2** and **3**, the proximal equipment support assembly **32** comprises an elongated receiving element **46** pivotably associated with an engaging or locking element **45**. An operational receiving space **52**, adapted to receive skis and snowboards is formed between the locking and receiving elements. The receiving element **46** has an elongated configuration and extends between a connecting end movably connected to the hub **30** and a free end thereof. The engaging or locking element **45** is pivotably connected to the receiving element **46** at the pivotal unit **42** provided at the free end of the receiving element. Similar to the above-discussed manner, the distal support assembly **34** comprises an engaging or locking element **47** pivotably connected to an elongated receiving element **48**. The receiving element **48** has an elongated configuration extending between a connecting end movably connected to the hub **40** and a free end thereof. The engaging element **47** is pivotably connected to the receiving element **48** at the pivotal unit **44**.

In each equipment support assembly, a receiving operational space **52** is defined between an inner surface of the respective receiving and engaging elements. Resilient mounting inserts **54**, **56** provided to engage or closely accommodate the skis and snowboards are attached to the interior of the locking and engaging elements, so as to be disposed within the operational receiving space **42**. The inserts **54**, **56** are made from a resilient/compressible material to assure the necessary friction and to prevent movement of the skis and snowboards, once they are locked within the interior space. Receiving cavities **68** adapted to accommodate skis or snowboards can be formed within the inserts **54**, **56** of either the receiving or engaging/locking elements. In the embodiment of FIGS. **2** and **3**, a plurality of inner cavities **58** extends inwardly from the inner surface into the body of the inserts.

Referring now to FIGS. **4-8**, wherein the equipment carrier of the invention for transportation of bicycles is best illustrated. In this embodiment the engaging/locking elements **45**, **47** and the receiving elements **46**, **48** are formed having substantially flat exterior surfaces. Other configuration of the exterior surfaces is also contemplated. Each equipment support assembly **32**, **34** is provided with at least a pair of spaced from each other an anti-sway bicycle mounting bracket **60** and a restricting mounting bracket **70**. The elbow-shaped anti-sway bracket **60** is formed with a connecting portion **62** and a stabilization portion **64**. The connecting portion **62** is adapted for connection to or

engagement with respective areas of the equipment support assemblies, whereas the stabilization portion **64** extends downwardly from and is pivotably associated with the connecting portion **62**. An inner area of the connecting portion **62** is configured for close engagement with the exterior of either engaging/locking elements **45**, **47** or the exterior of the receiving elements **46**, **48** of the respective equipment support assemblies **32**, **34**. It is illustrated in FIG. **5** that in one embodiment of the invention, the inner area of the connecting portion **62** is formed having a C-shaped configuration with a substantially flat engaging part **61** interconnecting upper **63** and lower **65** transverse members. The elbow-type stabilization portion **64** is formed with a connecting part **67** and a stabilization part **69** positioned at an angle to each other. The connecting part **67** is pivotably connected to the lower member **65** of the connecting portion **62**. The pivotal connection between the connecting **62** and stabilization **64** portions is resulted in the stabilization part **69** being adjusted between a position substantially perpendicular to the connecting portion **62** and the position, wherein the stabilization part is positioned at an angle to the connecting portion. This facilitates positioning of the bracket **60** within the bicycle frame and locks the frame, so as to prevent undesirable motion of the bicycle during the transportation. An upper mounting area **66** is provided at upper region of the connecting part **62**, whereas a lower mounting area **68** is associated with a free end of the stabilization part **69**. Each mounting area supports a flexible securing element or a securing strap **71** adapted for securing a bicycle frame to the anti-sway bicycle mounting bracket **60**.

As best illustrated in at least FIGS. **4-8**, an inner area **72** of the restricting mounting bracket **70** is also formed having a C-shaped configuration adapted for close engagement with the outer surfaces of either locking elements **45**, **47** or receiving elements **46**, **48** of the respective equipment support assemblies. A mounting area **74** is provided at an upper region of the bracket **70** and is adapted to support a flexible mounting element or a securing strap **75**, which secures this mounting bracket to a respective portion of the bicycle frame.

Thus, the restricting mounting bracket **70** with the securing strap **75** are provided to prevent movement of the bicycle within the equipment carrier of the invention in the upward and downward directions. On the other hand, the pivotal elbow **69** extending from the anti-sway bicycle mounting bracket **60** toward the front fork of the bicycle and the respective flexible securing strap **71** surrounding a vertical part of the bicycle fork prevent the bicycle from swaying left and right.

As illustrated in at least FIGS. **4-8**, in order to mount a bicycle on the equipment carrier **10** of the invention, the anti-sway mounting bracket **60** associated with one equipment support assembly and the restricting mounting bracket **70** associated with another equipment engagement assembly are utilized. As illustrated, in one embodiment of the invention (see FIG. **4**, for example), the receiving element **48** of the distal equipment engagement assembly **34** is utilized to support the anti-sway mounting bracket **60**. On the other hand, the respective restricting mounting bracket **70** is supported by the receiving element **46** of the proximal equipment support assembly **32**. As further illustrated, the flexible mounting element **75** associated with the restricting mounting bracket **70**, engages a horizontal part C of the bicycle frame in the vicinity of a saddle. The flexible mounting element **71** associated with the upper mounting area **66** of the anti-sway bracket **60** engages a horizontal part D of the bicycle frame in the vicinity of a vertical part E of the front fork of the bicycle. The elbow portion **69** of the anti-sway mounting bracket **60** is positioned at an inclined part F of the bicycle frame. Actually the pivoting elbow **69** protruding from below the distal support assembly **34** supports the bicycle at the front fork G preventing it from swaying. The flexible mounting element **71** associated with the low mounting area **68** is provided at the front of the bicycle and engages the vertical part E of the fork at the inclined part F of the bicycle frame.

In a manner similar to the above-discussed, in order to mount a second bicycle within the equipment carrier **10** of the invention (see FIG. **6**, for example), the receiving element **46** of the proximal equipment engagement assembly **32** is utilized to support the anti-sway mounting bracket **60**. On the other hand, the respective restricting mounting bracket **70** is supported by the receiving element **48** of the distal support assembly **34**. The flexible mounting element **75** associated with the restricting mounting bracket **70**, engages the horizontal part C the second bicycle frame in the vicinity of a saddle. The flexible mounting element **71** associated with the upper mounting area **66** of the anti-sway bracket **60** engages the horizontal part of the second bicycle frame in the vicinity of the vertical area of the front fork of the bicycle. The elbow portion **69** of the anti-sway mounting bracket **60** is positioned at the inclined part of the bicycle frame. The flexible mounting element **71** associated with the low mounting area **68** engages the vertical part of the fork at the inclined part of the bicycle frame.

In operation, in order to support skis and/or snowboard for transportation by a vehicle, inner end of each engaging/locking elements **45**, **47** is unlocked/released from its engagement with the locking mechanism provided in the vicinity of the respective hub. Then, the engaging elements **45**, **47** are moved/pivoted within the respective pivotal units **42**, **44**, so as to expose the operational space **52** and make it accessible for receiving equipment such as skis, snowboards, etc. Then, ski and/or snowboards are positioned within the inner receiving cavities **58**. The mounting process is completed by pivotal movement of the engaging elements **45**, **47** in the direction of the receiving elements **46**, **48**, so as to close the operational space **52** and to lock the equipment for transportation by fixing the end of the engaging elements within the locking units.

As best illustrated in FIGS. **1** and **2**, the carrier **10** is secured to the automobile by at least two pairs of adjustable length restraining straps. For example, a lower pair of straps **82** is connected to a lower part of the vehicle rear or a bumper B, and an upper pair of straps **84** is connected to an upper part of the vehicle rear or the front edge of the trunk lid L. The straps extend from each hub **30**, **40**, for securing carrier **10** of the invention to vehicle. The straps may be secured to the hubs in any conventional manner or may be connected to any other area of bicycle rack **10**. The upper and lower frames **12**, **14** are connected together at the intersection of the arms and are fixed at a particular angle relative to each other. The bicycles are supported on the carrier **10** by resting the cross bar or top tube of the bicycle frame on the support assemblies **32**, **34**. The bicycle frame generally lies against the element of the carrier, away from the vehicle. Additional straps, as well as the anti-sway **60** and the restricting mounting brackets **70** may be used to secure the bicycle in place during road travel of the vehicle.

With the configuration of the upper arms and the lower arms as shown and described, arms define a lower engagement area, located below the upper engagement area defined

by upper arms, which is adapted for engagement with a vehicle at a location below upper frame end member.

Upper arms **18**, **20** cooperate with lower arms **22**, **24** and the respective hubs to provide axial movement of upper frame **12** relative to lower frame **14**. In this manner, the upper engagement area defined by upper arms can be moved to an extended position as shown in FIGS. **1-3**, which is adapted for use with a vehicle having a relatively flat rear end, such as a van, station wagon, minivan, sport utility vehicle or the like. The upper engagement area defined by upper arms can also be moved to a retracted position as shown in FIGS. **4-6**, which is adapted for use with a trunk-type vehicle such as a sedan or coupe. These vehicles have a horizontal engagement surface defined by the top wall of the trunk of vehicle, as well as a vertical engagement surface defined by the bumper area of vehicle.

The axial position of the upper frame **12** and the lower frame **14** can be adjusted to any position as desired, while enabling to be selectively extended for use and collapsed for storage. When the equipment carrier **10** is not in use, lower frame **14** and upper frame **12** are moved by means of the hubs **30**, **40** to their collapsed inoperative position, so as to shorten and minimize the overall length of carrier to facilitate storage.

While the invention has been shown and described with respect to a particular embodiment, it is understood that various alternatives and modifications are contemplated as being within the scope of the present invention and covered by the appended claims. Such alternatives and modifications include, but are not limited to, the following. While the invention has been described in connection with the combination ski, snow board, bicycle carrier, it is understood that the invention may be incorporated in any type of carrier adapted for removable mounting to a vehicle and for supporting any type of equipment on the vehicle during transport. In addition, while upper frame **12** and lower frame **14** are illustrated as being in the form of U-shaped frames having a pair of arms, it is understood that the invention is capable of being used in connection with any type of frame arrangement, e.g. one in which the upper and/or lower frames are formed of a single arm or a series of arms.

The invention claimed is:

1. A combination equipment carrier adapted to be mounted at a rear of a vehicle, comprising:

an upper frame including first and second upper arms spaced from each other;

a lower frame including first and second lower arms spaced from each other;

a transverse connecting element interconnecting said upper frame and said lower frame;

a first hub, receiving a first end of said transverse connecting element, the first upper arm and the first lower arm being pivotably connected to each other at said first hub;

a second hub, receiving a second end of said transverse connecting element, the second upper arm and the second lower arm being pivotably connected to each other at said second hub;

a proximal support assembly movably arranged at the first hub at a junction between the first upper arm and the first lower arm, said proximal support assembly comprising a first elongated receiving element extending outwardly from said first hub and a first engaging/locking element, said first elongated receiving element including a connecting end movably connected to said first hub, and a free end including a first pivotal unit pivotally connecting said first engaging/locking element to said first receiving element, said first pivotal unit having a substantially vertically oriented pivotal axis, said first engaging/locking element is pivoted in a horizontal plane about said substantially vertically oriented pivotal axis, so that a substantial operational receiving space adapted to receive equipment is formed during the horizontal movement of said first engaging/locking element relative to said first receiving element;

a distal support assembly movably arranged at the second hub at a junction between the second upper arm and the second lower arm, said distal support assembly being spaced apart from said proximal support assembly;

wherein each of said proximal and distal support assemblies includes at least one anti-sway bicycle mounting bracket and at least one restricting mounting bracket, the anti-sway bicycle mounting bracket and the restricting mounting bracket being spaced from each other.

2. The carrier of claim **1**, wherein:

the distal support assembly comprises a second elongated receiving element extending outwardly from said second hub and a second engaging/locking element,

said second elongated receiving element including a second connecting end movably connected to said second hub, and a free end, including a second pivotal unit pivotally connecting said second engaging/locking element to said second receiving element,

said second pivotal unit having a substantially vertically oriented pivotal axis, wherein said second engaging/locking element is pivoted in a horizontal plane about said substantially vertically oriented pivotal axis, so that a substantial operational receiving space adapted to receive equipment is formed during the horizontal movement of said second engaging/locking element relative to said second receiving element.

3. The Carrier of claim **2**, wherein, in a first orientation of said distal support assembly, said second engaging/locking element is disposed parallel to said second elongated receiving element, and in a second orientation of said distal support assembly, said second engaging/locking element is pivoted in a horizontal plane about said substantially vertically oriented pivotal axis of said second pivotal unit to be angled with respect to said second elongated receiving element in a direction facing away from said proximal support assembly.

4. The carrier of claim **2**, wherein said first and said second engaging/locking elements have flat exterior surfaces.

5. The carrier of claim **4**, wherein said first and said second receiving elements have flat exterior surfaces.

6. The carrier of claim **1**, wherein:

each of said first and second hubs includes top, bottom, inner and outer regions;

the top region of each of said first and second hubs is formed with an opening adapted to receive a connecting end of a respective one of said first and second upper arms;

the bottom region of each of said first and second hubs is formed with an opening adapted to receive a connecting end of a respective one of said first and second lower arms; and

the inner region of each of the first and second hubs is adapted to fixedly accommodate a respective one of said first and second ends of the transverse connecting element.

7. The carrier of claim **6**, wherein the outer region of each of said first and second hubs movably accommodates an engaging end of a corresponding one of the proximal and

distal support assemblies, and wherein said first and second hubs are movable so as to provide pivotal motion of the upper and lower frames about a longitudinal axis extending along the transverse connecting element.

8. The carrier of claim **1**, wherein each said anti-sway bicycle mounting bracket has an elbow-shaped configuration including a connecting portion and a stabilization portion positioned at an angle to each other, wherein the connecting portion is connected to one of said proximal and said distal support assemblies, and the stabilization portion extends downwardly from, and is pivotally associated with, the connecting portion.

9. The carrier of claim **8**, wherein, in each said anti-sway bicycle mounting bracket:

the stabilization portion is pivotably connected to a lower area of the connecting portion;

an upper mounting area is provided at an upper region of the connecting portion;

a lower mounting area is formed at a free end of the stabilization portion; and

a flexible mounting element is provided at said lower mounting area for securing the anti-sway bicycle mounting bracket to a portion of a bicycle frame.

10. The carrier of claim **9**, wherein said restricting mounting bracket includes:

a C-shaped inner area adapted for engagement with an outer surface of a corresponding one of said first and second engaging/locking elements or with a portion of a corresponding one of said first and second receiving elements;

a mounting area, disposed at an upper region of the restricting mounting bracket, so as to support a second flexible mounting element suitable for securing the restricting mounting bracket to a portion of the bicycle frame.

11. The Carrier of claim **1**, wherein, in a first orientation of said proximal support assembly, said first engaging/locking element is disposed parallel to said first elongated receiving element, and in a second orientation of said proximal support assembly, said first engaging/locking element is pivoted in a horizontal plane about said substantially vertically oriented pivotal axis of said first pivotal unit to be angled with respect to said first elongated receiving element in a direction facing away from said distal support assembly.

12. A method of supporting at least one bicycle by a transportation carrier, said transportation carrier comprising:

a proximal support assembly movably arranged at a first hub, said proximal support assembly comprising a first elongated receiving element extending outwardly from said first hub and a first engaging/locking element, said first elongated receiving element including a connecting end movably connected to said first hub, and a free end including a first pivotal unit pivotally connecting said first engaging/locking element to said first receiving element, said first pivotal unit having a substantially vertically oriented pivotal axis, a distal support assembly movably arranged at a second hub, and being spaced from said proximal support assembly; each of said proximal and distal support assemblies including an anti-sway bicycle mounting bracket and a restricting mounting bracket spaced from said anti-sway bicycle mounting bracket; each said anti-sway bicycle mounting bracket having a connecting portion and a stabilization portion positioned at an angle relative to each other; each said connecting portion is connected to a corresponding one of said proximal and said distal support assembly, each said stabilization portion extends downwardly from, and is pivotal about, the corresponding connecting portion; each said restricting mounting bracket includes a flexible mounting element; wherein the at least one bicycle comprises a frame having a horizontal part, an inclined part positioned at an angle to the horizontal part, a front fork and a saddle;

said method comprising the steps of:

pivoting said first engaging/locking element in a substantially horizontal plane about said substantially vertically oriented pivotal axis, so that an operational receiving space adapted to receive equipment is formed during the horizontal movement of said first engaging/locking element relative to said first receiving element;

selecting a first said anti-sway bicycle mounting bracket associated with one of said proximal and distal support assemblies and a first said restricting mounting bracket associated with the other one of said proximal and distal support assemblies;

connecting said first restricting mounting bracket to the horizontal part of the bicycle frame in the vicinity of the saddle to secure the horizontal part of the bicycle frame; and

connecting said first anti-sway bicycle mounting bracket to the bicycle by connecting the connecting portion of the first anti-sway bicycle mounting bracket to the horizontal portion of the bicycle frame and positioning the stabilization portion of the first anti-sway bicycle mounting bracket adjacent the inclined part of the bicycle frame, so that the stabilization portion supports the bicycle at the front fork, thereby preventing the bicycle from swaying.

13. The method of claim **12**, further comprising the steps of:

preventing vertical movement of the bicycle within the transportation carrier by engaging the flexible mounting element of the first restricting mounting bracket to a vertical part of the front fork; and

preventing side-to-side swaying of the bicycle by extending the stabilization portion from the first anti-sway bicycle mounting bracket toward the front fork of the bicycle and by wrapping the flexible mounting element of the first restricting mounting bracket around the vertical part of the front fork.

14. The method of claim **13**, wherein

the distal support assembly comprises a second elongated receiving element extending outwardly from said second hub and a second engaging/locking element, said second elongated receiving element including a second connecting end movably connected to said second hub, and a free end, including a second pivotal unit pivotally connecting said second engaging/locking element to said second receiving element, said second pivotal unit having a substantially vertically oriented pivotal axis, said method further comprising the step of:

pivoting said second engaging/locking element in a horizontal plane about said substantially vertically oriented pivotal axis, so that a substantial operational receiving space adapted to receive equipment is formed during the horizontal movement of said second engaging/locking element relative to said second receiving element.

15. The method of claim **13**, wherein each said restricting mounting bracket further includes a C-shaped inner area and wherein said method further comprises the steps of:

mounting a second bicycle within the transportation carrier by:

selecting a second said anti-sway bicycle mounting bracket associated with said other one of said proximal and distal support assemblies and a second said restricting mounting bracket associated with said one of said proximal and distal support assemblies;

connecting said second restricting mounting bracket to a horizontal portion of a second bicycle frame of the second bicycle in the vicinity of a saddle thereof;

connecting said second anti-sway bicycle mounting bracket to the second bicycle by connecting the connecting portion of the second anti-sway bicycle mounting bracket to the horizontal portion of the second bicycle frame and positioning the stabilization portion of the second anti-sway bicycle mounting bracket adjacent an inclined part of the second bicycle frame, so that the stabilization portion supports the second bicycle at a front fork thereof, thereby preventing the second bicycle from swaying.

16. The method of claim **15**, further comprising the steps of:

preventing vertical movement of the second bicycle within the transportation carrier by engaging the flexible mounting element of the second restricting mounting bracket to a vertical part of the front fork of the second bicycle; and

preventing side-to-side swaying of the second bicycle by extending the stabilization portion from the second anti-sway bicycle mounting bracket toward the front fork of the second bicycle and by wrapping the flexible mounting element of the second restricting mounting bracket around the vertical part of the front fork of the second bicycle.

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