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(54) **Title**: A BRAKING SYSTEM FOR A RECREATIONAL RIDING-BOARD

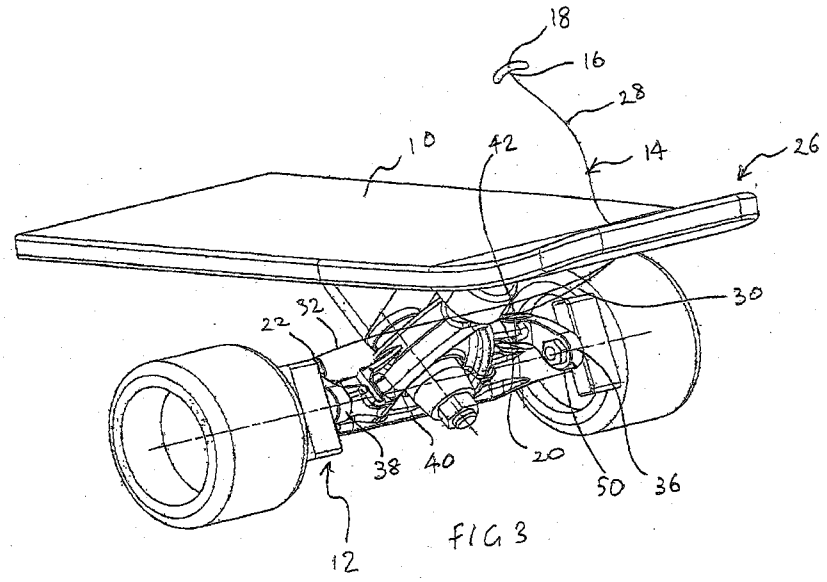


FIG 3

(57) **Abstract**: The present invention relates to a braking system for a recreational riding-board. The braking system includes a braking mechanism and an activating means. The braking mechanism is adapted to slow down or stop, the motion of the riding-board. The activating means is adapted to control the braking mechanism. The activating means in use is located between the middle and rear end of the riding-board.

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A Braking System for A Recreational Riding-board

Technical Field

This invention broadly relates to a braking system for recreational riding-boards. In particular, the invention relates to a braking system for recreational riding-boards capable of enabling a rider to maintain balanced during braking.

Background of the Invention

It is desirable in the board-riding industry to provide riding-boards that are safe and versatile. One way to achieve this is to provide a braking system which enables the rider to slow down or stop particularly when riding downhill.

Existing braking systems have a shortcoming in that when the brake is applied, the rider is likely to be thrown off balance due to forward momentum. Hence riding-boards equipped with such a braking system are actually more dangerous to ride.

It is an object of the present invention to provide a braking system which is capable of ameliorating or overcoming the above shortcoming or which will at least provide a useful alternative.

Summary of the Invention

According to one aspect of the present invention there is provided a braking system for a recreational riding-board, the braking system including:

a braking mechanism adapted to slow down or stop the motion of the riding-board; and

an activating means adapted to control the braking mechanism;

wherein the activating means in use is located between the middle and rear end of the riding-board.

In a preferred embodiment, the activating means has a first end adapted in use to be held by a rider and a second end operatively connected to the braking mechanism.

Preferably, the activating means in use in located in the vicinity of the rear end of the riding-board.

In a preferred embodiment, the activating means is removably attached to the riding-board. The activating means may include a pliable tether. When subjected to a pulling force exerted by the rider, the activating means is preferred to be capable of changing from a slack state to a tensioned state.

Preferably, the tensioned activating means is capable of providing the rider with leverage. As such, the tensioned activating means is capable of activating the braking mechanism and bracing the rider against forward momentum simultaneously.

Preferably, the tensioned tether is capable of inhibiting further forward momentum of the rider caused by braking. In a first embodiment, the recreational riding-board is a skateboard. The skateboard includes an aperture. Preferably, the aperture is located toward the rear of the riding-board. The aperture is preferred to provide a fulcrum against which the tether bears.

Preferably, the tether includes a first portion including the first end and being disposed on one side of the skateboard. The first end is preferred to include a handle adapted to facilitate gripping by the rider. The tether is preferred to include second portion including the second end and a third portion including a third end, both of the second and third portions being disposed on an opposing side of the riding-board.

Optionally, the first portion of the tether is covered by a telescopic sheath extending from the upper surface of the skateboard.

Alternatively, the activating means is in the form of a rigid stick, rod or wire.

The braking mechanism may include one or more levers. Preferably, the braking mechanism includes a pair of levers, each being connected to a truck of the skateboard via a pivot hinge. Each of the second and third ends of the tether is connected to one end of a corresponding lever. The other end of each lever is preferred to be attached to a

braking means adapted in use to engage a rear wheel of the skateboard. Each braking means may be in the form of a brake pad.

The braking mechanism may include an additional pair of levers for the front wheels of the skateboard. In such an embodiment, the tether includes fourth and fifth portions, each having an end connected to the corresponding additional lever.

Each of the levers may be a cam lever or biased.

In another embodiment, the recreational riding-board includes a snowboard or sandboard. The snowboard or sandboard may include one or more apertures adapted to accommodate the braking mechanism.

The braking mechanism is preferred to include a lever which is tied at one end to the tensioned tether and pivotally hinged toward the rear of the riding-board. The lever is preferred to follow a curve which conforms to a bent end of the riding-board.

Preferably, the lever includes or is connected to a blade at another end, the blade being adapted in use to plough into or through snow or sand. More preferably, the lever is pivotally connected to a holder which is affixed to the snowboard or sandboard.

The braking mechanism is preferred to include an impediment which in combination with the holder is capable of restricting pivotal movement of the lever. As such, the extent to which the blade ploughs into the snow or sand may be controlled by installation or removal of the impediment. The impediment is preferably in the form of a pin.

In another embodiment, the riding-board has two apertures each in the form of a slot located toward the rear end of the snowboard or sandboard. In this embodiment, the lever is U-shaped having a pair of prongs adapted in use to plough into or through snow or sand. Each prong is preferred to be aligned with the corresponding slot.

Preferably, each prong has one or more fingers adapted to plough into the snow or sand. Optionally, the or each finger is attached to an elongate snowplough or sandplough.

Preferably, the tensioned tether is capable of pivoting the lever from a retracted position where the prongs are not in contact with the snow or sand to a braking position where the prongs are lowered to plough into the snow or sand. The lever may include biasing means such that it is biased back into the retracted position when not in use.

Brief Description of the Drawings

The invention may be better understood from the following non-limiting description of preferred embodiments, in which:

Figure 1 is a bottom view of the rear of a skateboard with a braking system in accordance with a first embodiment of the present invention mounted on the rear wheels;

Figure 2 is a plan view of the braking system of Figure 1 mounted on the truck of the skateboard with the board removed;

Figure 3 is a perspective view of the braking system of Figure 1 mounted onto the rear of the skateboard;

Figure 4 is a side view of the braking system of Figure 1 mounted to the rear of the skateboard, the tether of the braking system covered by a telescopic sheath;

Figure 4a is a bottom view of the rear of the skateboard with a braking system in accordance with another embodiment of the present invention mounted on the rear wheels;

Figure 5 is a plan view of a braking system in accordance with a further embodiment of the present invention mounted on a snowboard or sandboard;

Figure 6 is a side view of the braking system of Figure 5 mounted on the snowboard or sandboard with the lever in a retracted position;

Figure 7 is a perspective view from the rear of the snowboard or sandboard with the braking system of Figure 5 having the lever in the retracted position;

Figure 8 is a perspective view from the bottom of the snowboard or sandboard with the lever of the braking system of Figure 5 in the retracted position through the slots of the snowboard;

Figure 9 is a perspective view of the snowboard or sandboard with the braking system of Figure 5 with the lever in a braking position;

Figure 10 is a perspective view of the snowboard or sandboard with the braking system of Figure 5 with a modified lever;

Figure 11 is a perspective view of a braking system for a snowboard or sandboard in accordance with a yet further embodiment with an impediment in an operating position;

Figure 12 is a plan view of the braking system of Figure 11;

Figure 13 is a side view of the braking system of Figure 11;

Figure 14 is a perspective view from one side of the braking system of Figure 11 with the impediment in a non-operating position; and

Figure 15 is a perspective view from an end of the braking system of Figure 11 with the impediment in a non-operating position.

Detailed Description of the Drawings

Different embodiments of the braking system of the present invention are intended to be applicable to different recreational riding-boards such as skateboards and snowboards which are illustrated and described herein. However, it should be noted that the braking system of the present invention may be applied to other types of recreational riding-boards such as sandboards. It should also be noted that the braking system of the present invention is retrofittable onto a used riding-board.

Referring to Figures 1, 2 and 3, a first embodiment of a braking system 12 is shown being mounted on a skateboard 10. The braking system 12 includes a braking mechanism and an activating means which is in the form of a pliable tether 14. The

braking mechanism is provided in order to enable a rider (not shown) to slow down or stop the motion of the skateboard. It should be noted that the activating means in use is located between the middle and rear end of the riding-board. Generally speaking, better control would be attained by having the activating means located towards the rear end of the riding-board. However, the ideal location of the activating means may vary depending on the landscape on which skating takes place as the centre of gravity shifts and hence it is contemplated that the activating means may be provided at more than one location.

As best shown in Figure 3, the tether 14 has a first end 16 with a handle 18 for gripping by a rider, and second and third ends 20 and 22 operatively and respectively connected to the braking mechanism (see below for details).

As best shown in Figure 1, the skateboard 10 has an aperture 24 which is located toward the rear 26 of the skateboard 10. The tether 14 includes a first portion 28 (see Figure 3) having the first end 16 and being disposed on an upper side of the skateboard 10. The tether 14 also has a second portion 30 with the second end 20 and a third portion 32 with a third end 22. Both of the second and third portions 30 & 32 are disposed on an underside of the skateboard 10.

The second and third portions 30 and 32 meet at a meeting point 34 and merge to become the first portion 28 which extends through the aperture 24 being exposed on the upper side of the skateboard 10. In use, the aperture 24 provides a fulcrum against which the tether 14 bears.

As best shown in Figures 1 and 3, the braking mechanism includes a pair of levers 36 and 38. Each of the lever 36, 38 is connected to a truck 40 of the skateboard 10 via a pivot hinge 42, 44 (see Figure 2). Each end 20, 22 of the tether 14 is connected to one end 46, 48 of a corresponding lever 36, 38. The other end 50, 52 of each lever 36, 38 is attached to a braking means in the form of a brake pad 54, 56 which in use is configured to engage a rear wheel 58, 60 of the skateboard 10.

In use, the tether 14 is generally in a slack state as best shown in Figure 3. When pulled by the rider, the tether 14 changes from the slack state to a tensioned state. As a result, the levers 36 & 38 are pulled to pivot about the hinges 42 & 44 thereby causing the brake pads 54 & 56 to engage the wheels 58 & 60 respectively. The tensioned tether 14 also enables the rider to gain leverage and maintaining the pulling force. As such, the rider is able to activate the braking mechanism and bracing him or her self against forward momentum simultaneously. Furthermore, the tensioned tether 14 is capable of inhibiting further forward momentum of the rider caused by braking.

Referring to Figure 4, as an alternative, the first portion 28 of the tether 14 is covered by a telescopic sheath 62 which extends from the upper surface of the skateboard 10 all the way to a handle which is in the shape of a spherical knob 64.

It is contemplated that the braking mechanism may have an additional pair of levers for the two front wheels (not shown) of the skateboard 10. In such an embodiment, the tether 14 has fourth and fifth portions, each having an end connected to a corresponding additional lever which is affixed to the front truck.

Also, although not shown in the accompanying drawings, each of the levers may be a cam lever or spring loaded such that once the rider stops exerting a pulling force on the tether 14 via the handle 18, the levers 36 and 38 will pivot back to the original positions thereby effecting disengagement of the brake pads 54 & 56 from the wheels 58 & 60.

Referring to Figure 4, another embodiment of the braking system 12C with a different braking mechanism is shown. This braking mechanism has two levers 100 & 102, each being connected to a truck 104 of the skateboard 10 via a pivot hinge 106, 108. Each of tether portions 110 & 112 is connected to one end of the corresponding lever 100, 102. Each lever 100, 102 when pulled, is designed to cause engagement of a brake pad 114, 116 with the corresponding wheel 58, 60 thereby effecting braking of the skateboard 10.

Turning now to Figures 5 to 9, a further embodiment 12A of the braking system is shown being mounted on a snowboard 66. The snowboard 66 has two apertures 68 & 70

each in the form of a slot located toward the rear end 72 of the snowboard 66. The rear end 72 of the snowboard is designed to bend upwards which means that when in use, the rear end 72 is not in contact with the snow surface.

In the present embodiment, the braking mechanism has a tether 14A which is tied to a U-shaped lever 74 which is located toward the rear end 72 of the snowboard 66. The lever 74 follows a curve which conforms to the bend toward the rear end 72 of the snowboard 66. The U-shaped lever 74 has a pair of prongs 76 & 78. The middle of each prong 76, 78 is pivotally hinged to the snowboard 66 and spring loaded. As such, when the front end 80 of the lever 74 is lifted from a retracted position by the pulling force exerted by the tensioned tether 14A, the prongs 76 & 78, which are aligned with corresponding slots 68 & 70, are pivoted into a braking position where the prongs are lowered to plough into the snow through the slots 68 & 70. The lever 74 is spring loaded such that it is biased back into the retracted position when the pulling force is no longer exerted by the tether 14.

As best shown in Figure 9, each prong 76, 78 has two fingers 82 & 84 which in use plough into the snow in order to slow down or stop the forward motion of the snowboard 66. Referring to Figure 10, as an alternative, each finger 82, 84 is attached to an elongate snowplough 86, 88 which is configured to provide an enhanced ploughing effect.

Referring to Figures 11 to 15, a yet further embodiment of the braking system 12D with a different braking mechanism is provided. Another embodiment of a snowboard (not shown) is provided having only one aperture in the form of a slot adapted to accommodate this braking mechanism.

Referring to Figures 11 to 15, in this embodiment, the braking mechanism has a lever 118 which is tied at one end 120 to a tether (not shown) and pivotally hinged toward the rear of the snowboard (not shown) via a holder 122. The lever 118 follows a curve which conforms to a bent rear end of the snowboard.

The lever 118 is connected to a curved blade 124 at one end 127. The blade 124 is adapted in use to plough into or through snow (or sand in the case of the riding-board being a sandboard). The lever 118 is pivotally connected to the holder 122 which is affixed to the snowboard via fixing means 126 which may be rivets or screws. Similar to the previously described embodiment, the lever 118 is equipped with biasing means such that it is biased back into the retracted position when not in use.

As shown in Figures 11 to 15, the holder 122 has two portions 122A & 122B which are respectively affixed to the surface of the snowboard. The braking mechanism has an impediment in the form of a pin 128 which in combination with the holder 122 is capable of restricting pivotal movement of the lever 118. As such, the extent to which the blade 124 ploughs into the snow may be controlled by installation or removal of the pin 128. The pin 128 which is designed in use to go through holes provided in the holder portions 122A & 122B. Once put in place, the pin 128 functions to prevent the level 118 from pivoting beyond 45 degrees to the horizontal, for example, such that the blade 124 in turn is restricted from ploughing deep into the snow. If desired, the pin 128 may be removed from the holder 122 in order to allow the blade 124 to plough deep into the snow. Turning to Figures 13 to 15, the removed pin 128 may be placed and stored in a hole 130 provided at the other end 132 of the lever 118. Now that preferred embodiments of the present invention have been described in some detail, it will be apparent to a skilled person in the art that the braking system of the present invention may offer at least the following advantages:

1. it enables braking of the riding-board as well as enabling the rider to brace his or her self such that he or her won't lose balance;

2. it provides the rider with leverage during braking such that the rider doesn't get thrown off balance by the forward momentum resulting from braking;

3. it facilitates safe board-riding;

4. it makes it safer and easier for starters to learn to ride a recreational board;

5. it is easy to install/retrofit and use;

6. in the case of a snowboard, it allows the user to adjust the braking mechanism to suit different snow conditions

Those skilled in the art will appreciate that the invention described herein is susceptible to variations and modifications other than those specifically described. All such variations and modifications are to be considered within the scope and spirit of the present invention the nature of which is to be determined from the foregoing description.

Claims

1. A braking system for a recreational riding-board, the braking system including:
a braking mechanism adapted to slow down or stop the motion of the riding-board; and
an activating means adapted to control the braking mechanism;
wherein the activating means in use is located between the middle and rear end of the riding-board.

2. The braking system of claim 1, wherein the activating means has a first end adapted in use to be held by a rider and a second end operatively connected to the braking mechanism.

3. The braking system of either claim 1 or 2, the activating means in use in located in the vicinity of the rear end of the riding-board.

4. The braking system of any one of the preceding claims, wherein the activating means is removably attached to the riding-board.

5. The braking system of any one of the preceding claims, wherein the activating means includes a pliable tether which, when subjected to a pulling force exerted by a rider, is capable of changing from a slack state to a tensioned state.

6. The braking system of claim 5, wherein the tether in the tensioned state is capable of activating the braking mechanism and bracing the rider against forward momentum simultaneously.

7. The braking system of claim 6, wherein the tensioned tether is capable of inhibiting further forward momentum of the rider caused by braking.

8. The braking system of any one of the preceding claims, wherein the recreational riding-board is a skateboard with an aperture.

9. The braking system of claim 8, wherein the aperture is located toward the rear

end of the riding-board providing a fulcrum against which the tether bears.

10. The braking system of either claim 8 or 9, wherein the tether includes a first portion including a first end and being disposed on one side of the skateboard.

11. The braking system of claim 10, wherein the first end includes a handle adapted to facilitate gripping by the rider.

12. The braking system of either claim 10 or 11, wherein the tether includes a second portion including a second end and a third portion including a third end, both of the second and third portions being disposed on an opposing side of the skateboard.

13. The braking system of any one of claims 10 to 12, wherein the first portion of the tether is covered by a telescopic sheath extending from the upper surface of the skateboard.

14. The braking system of any one of claims 1 to 4, wherein the activating means is in the form of a rigid stick, rod or wire.

15. The braking system of any one of the preceding claims, wherein the braking mechanism includes one or more levers.

16. The braking system of any one of claims 1 to 14, wherein the braking mechanism includes a pair of levers, each being connected to a truck of the skateboard via a pivot hinge.

17. The braking system of any one of claims 12, 13 and 16, wherein each of the second and third ends of the tether is connected to one end of a corresponding lever.

18. The braking system of claim 17, wherein the other end of each lever is attached to a braking means adapted in use to engage a rear wheel of the skateboard.

19. The braking system of claim 18, wherein the braking means is in the form of a

brake pad.

20. The braking system of any one of claims 16 to 19, wherein the braking mechanism includes an additional pair of levers for the front wheels of the skateboard.

21. The braking system of claim 20, wherein the tether includes fourth and fifth portions, each having an end connected to the corresponding additional lever.

22. The braking system of any one of claims 15 to 21, wherein each of the levers is a cam lever or biased.

23. The braking system of any one of claims 1 to 7, wherein the recreational riding-board includes a snowboard or sandboard.

24. The braking system of claim 23, wherein the snowboard or sandboard includes one or more apertures adapted to accommodate the braking mechanism.

25. The braking system of any one of claims 1 to 7, 23 and 24, wherein the braking mechanism includes a lever which is tied at one end to the tensioned tether and pivotally hinged toward the rear of the riding-board.

26. The braking system of claim 25, wherein the lever follows a curve which conforms to a bent end of the riding-board.

27. The braking system of either claim 25 or 26, wherein the lever includes or is connected to a blade at another end, the blade being adapted in use to plough into or through snow or sand.

28. The braking system of any one of claims 25 to 27, wherein the lever is pivotally connected to a holder which is affixed to the snowboard or sandboard.

29. The braking system of claim 28, wherein the braking mechanism includes an impediment which in combination with the holder is capable of restricting pivotal movement of the lever.

30. The braking system of claim 29, wherein the extent to which the blade ploughs into the snow or sand is controlled by installation or removal of the impediment.

31. The braking system of either claim 29 or 30, wherein the impediment is in the form of a pin.

32. The braking system of any one of claims 24 to 31, wherein the two apertures each in the form of a slot located toward the rear end of the snowboard or sandboard.

33. The braking system of claim 32, wherein the lever is U-shaped having a pair of prongs adapted in use to plough into or through snow or sand.

34. The braking system of claim 33, wherein each prong is aligned with the corresponding slot.

35. The braking system of either claim 33 or 34, wherein each prong has one or more fingers adapted to plough into the snow or sand.

36. The braking system of claim 35, wherein the or each finger is attached to an elongate snowplough or sandplough.

37. The braking system of any one of claims 33 to 36, wherein the tensioned tether is capable of pivoting the lever from a retracted position where the prongs are not in contact with the snow or sand to a braking position where the prongs are lowered to plough into the snow or sand.

38. The braking system of any one of claims 15 to 37, wherein the lever includes biasing means.

39. A braking system substantially as herein described with reference to any one of the accompanying drawings.

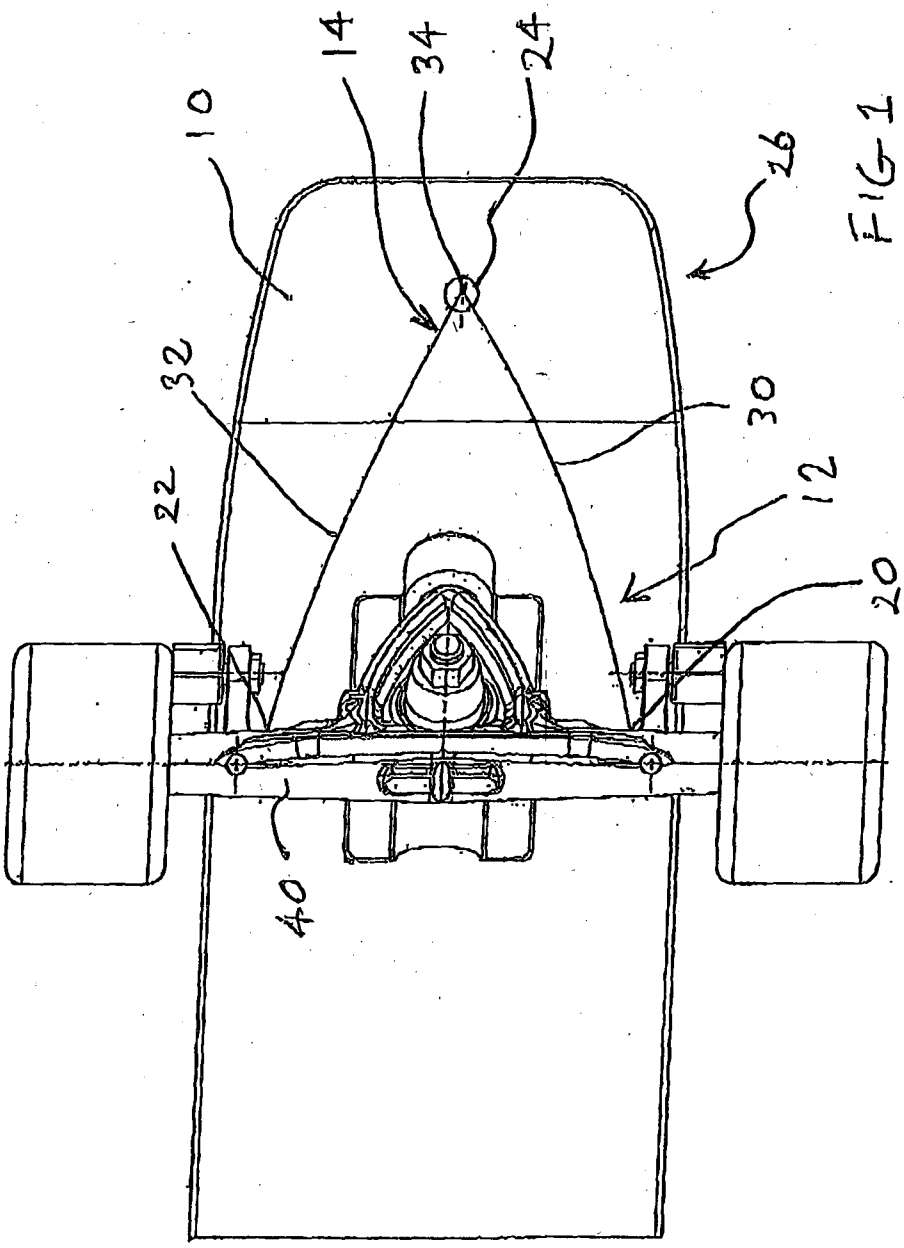


FIG 1

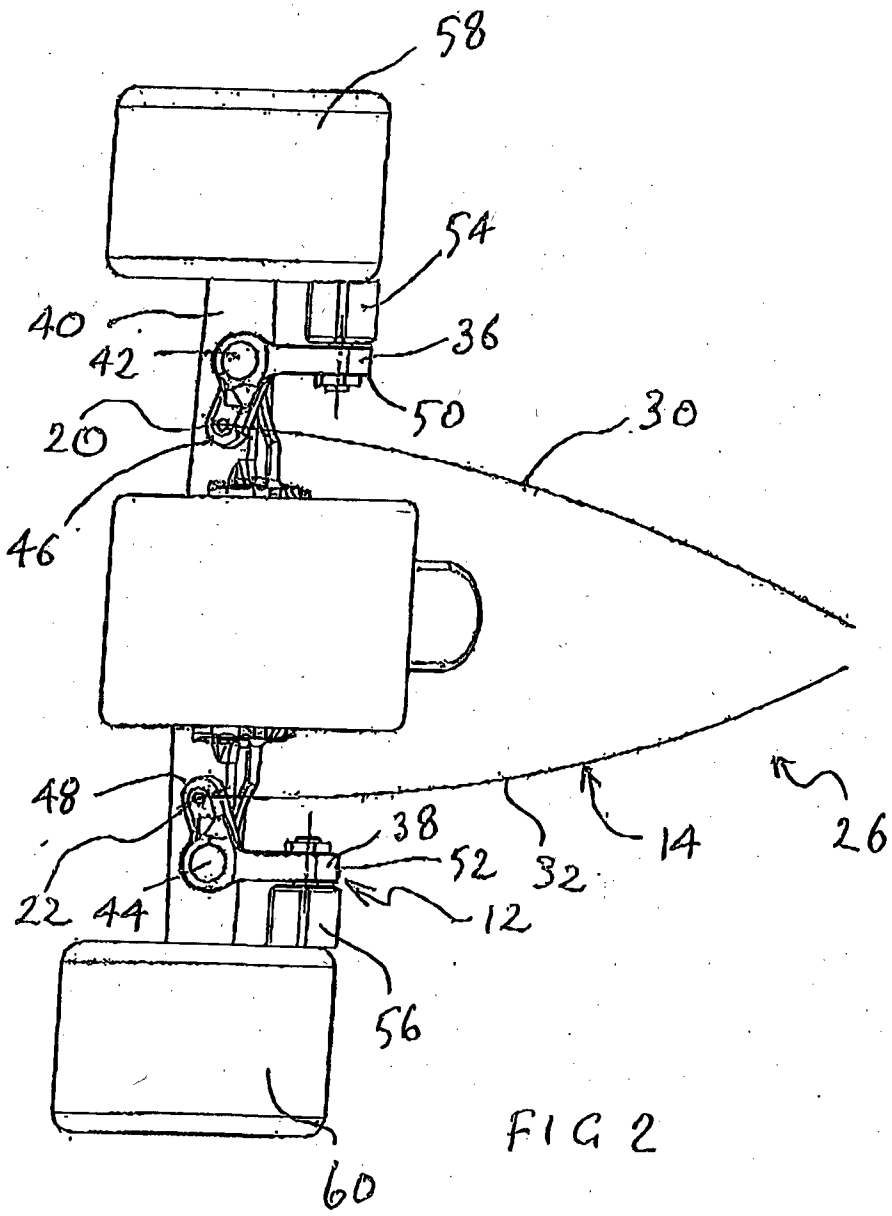


FIG 2

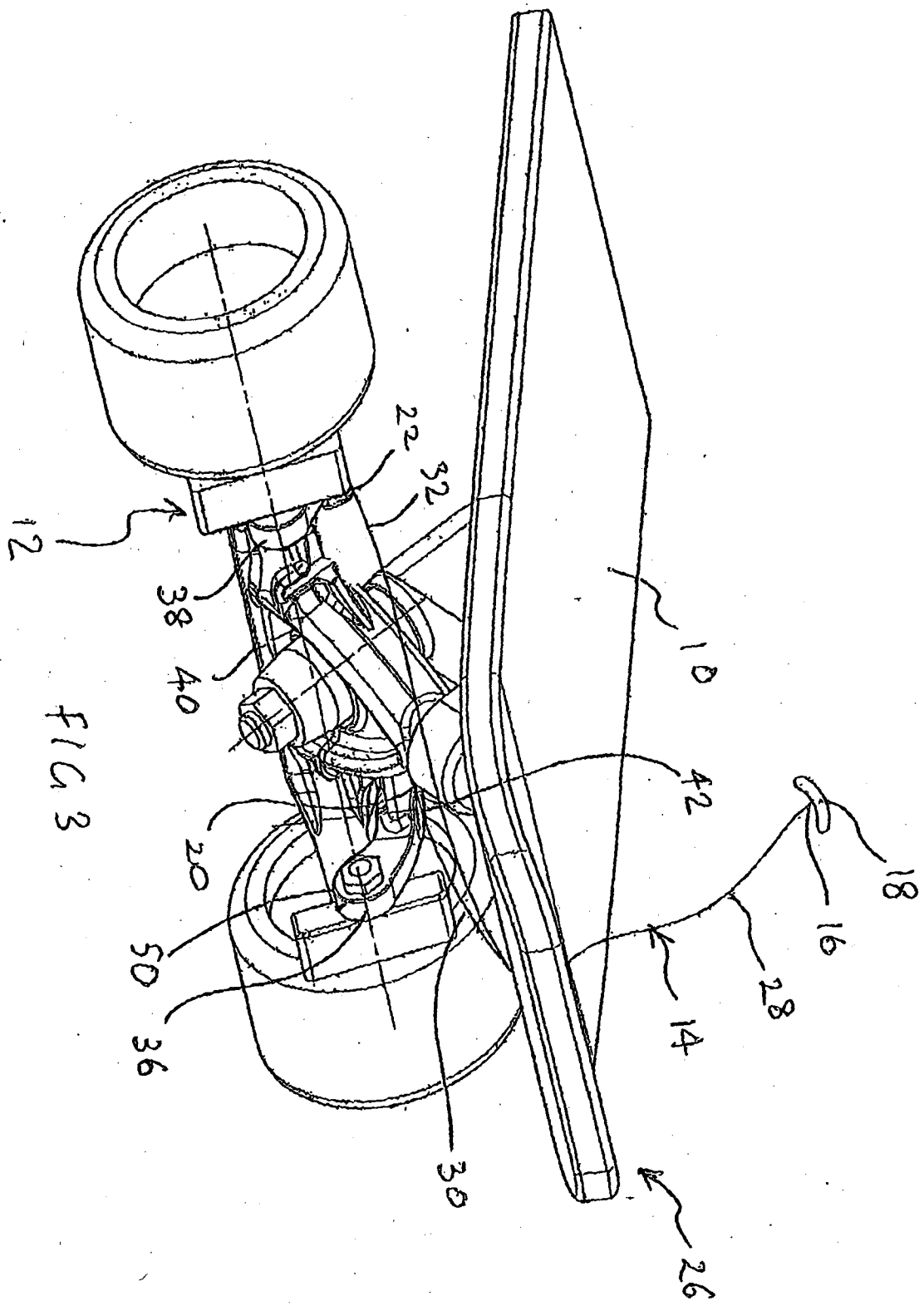


FIG 3

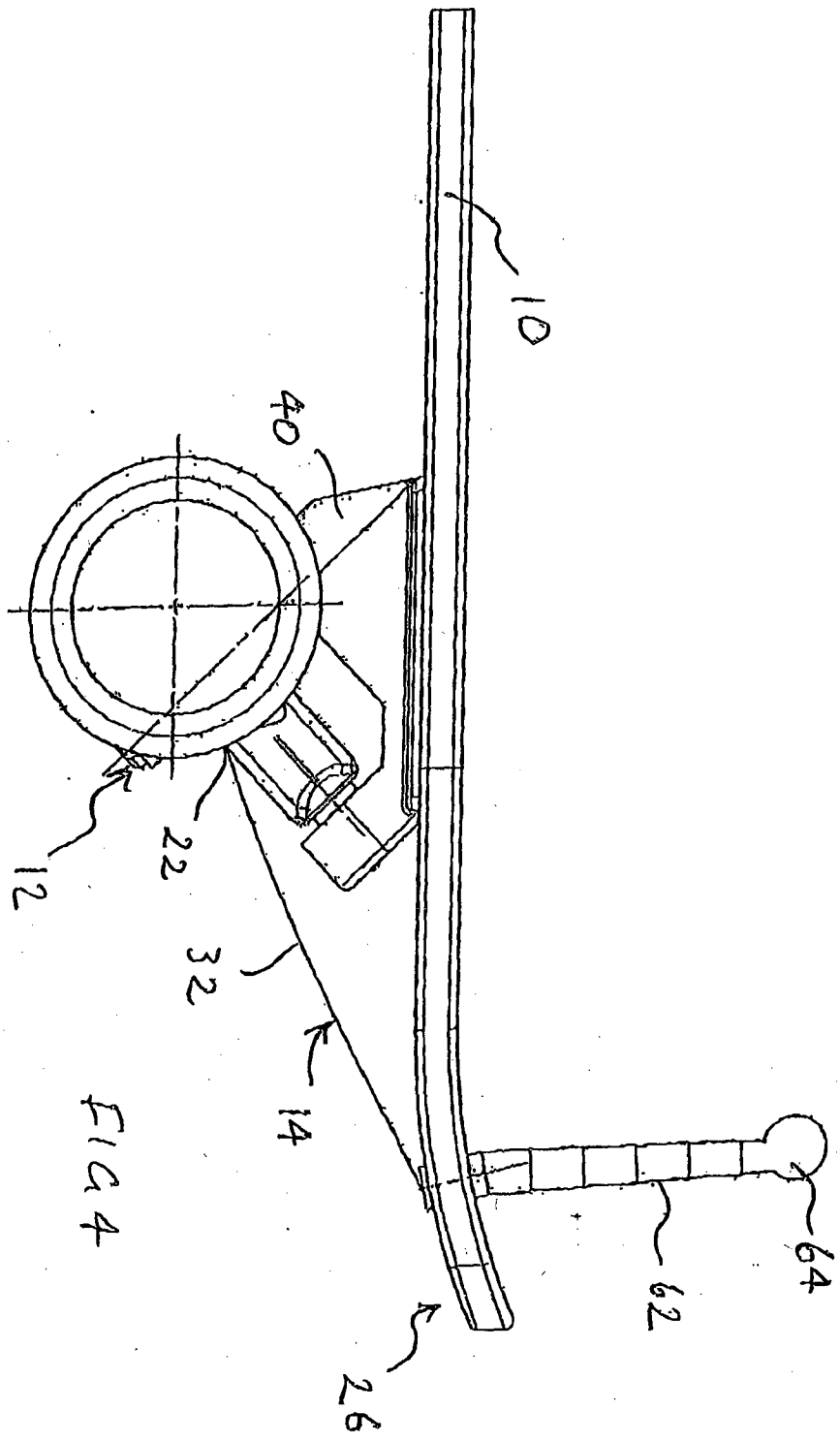


FIG 4

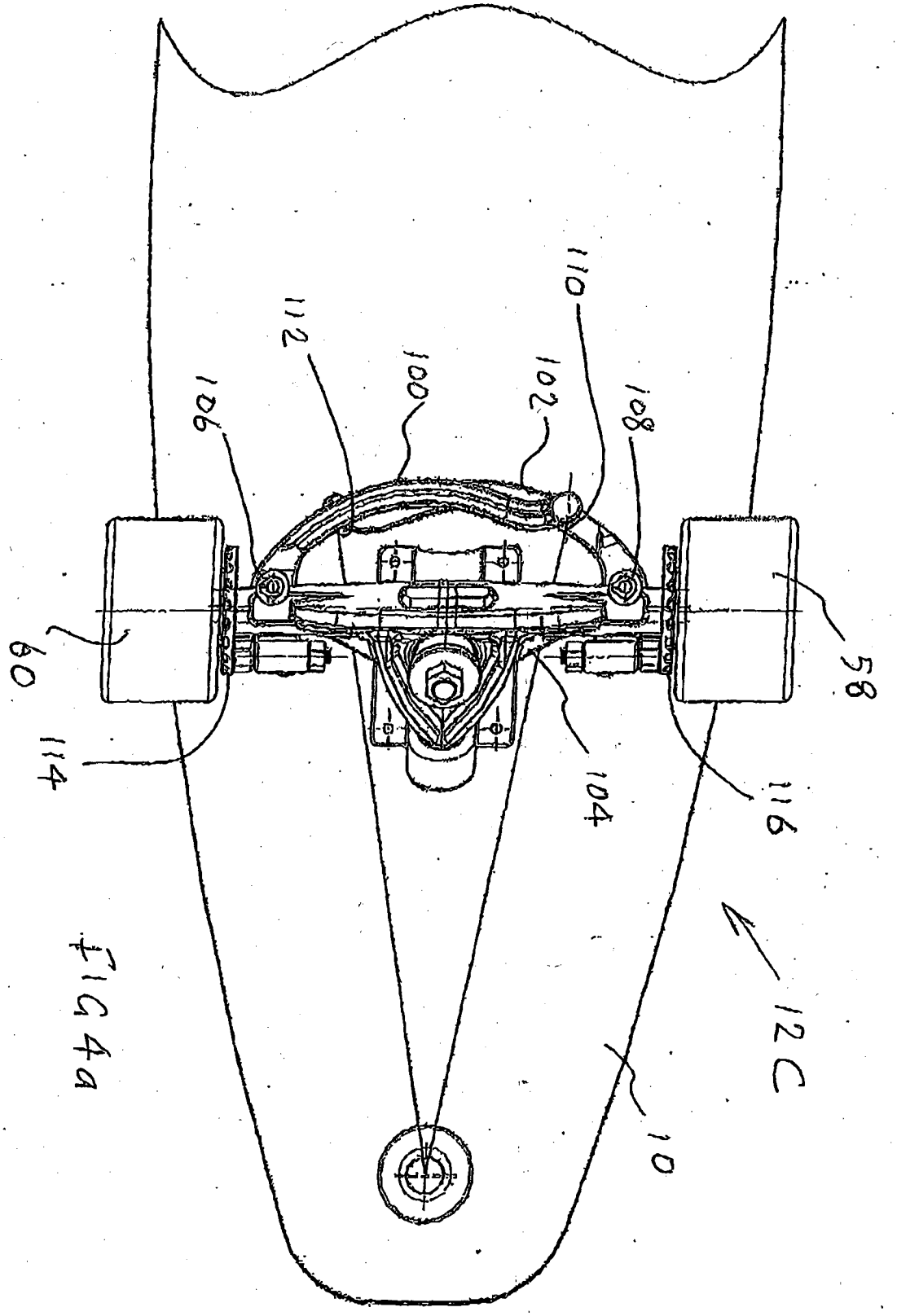


Fig 4a

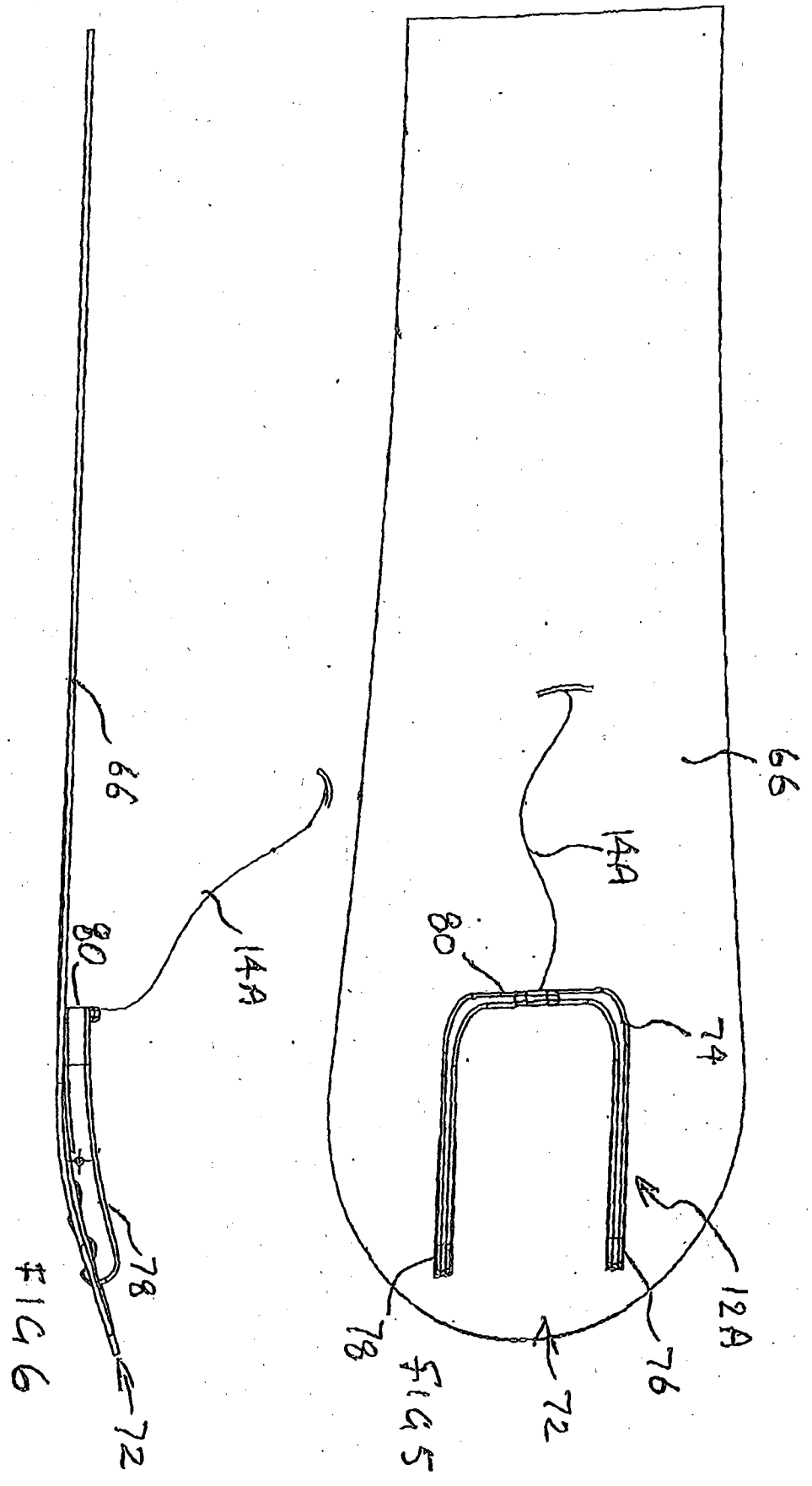


FIG 5

FIG 6

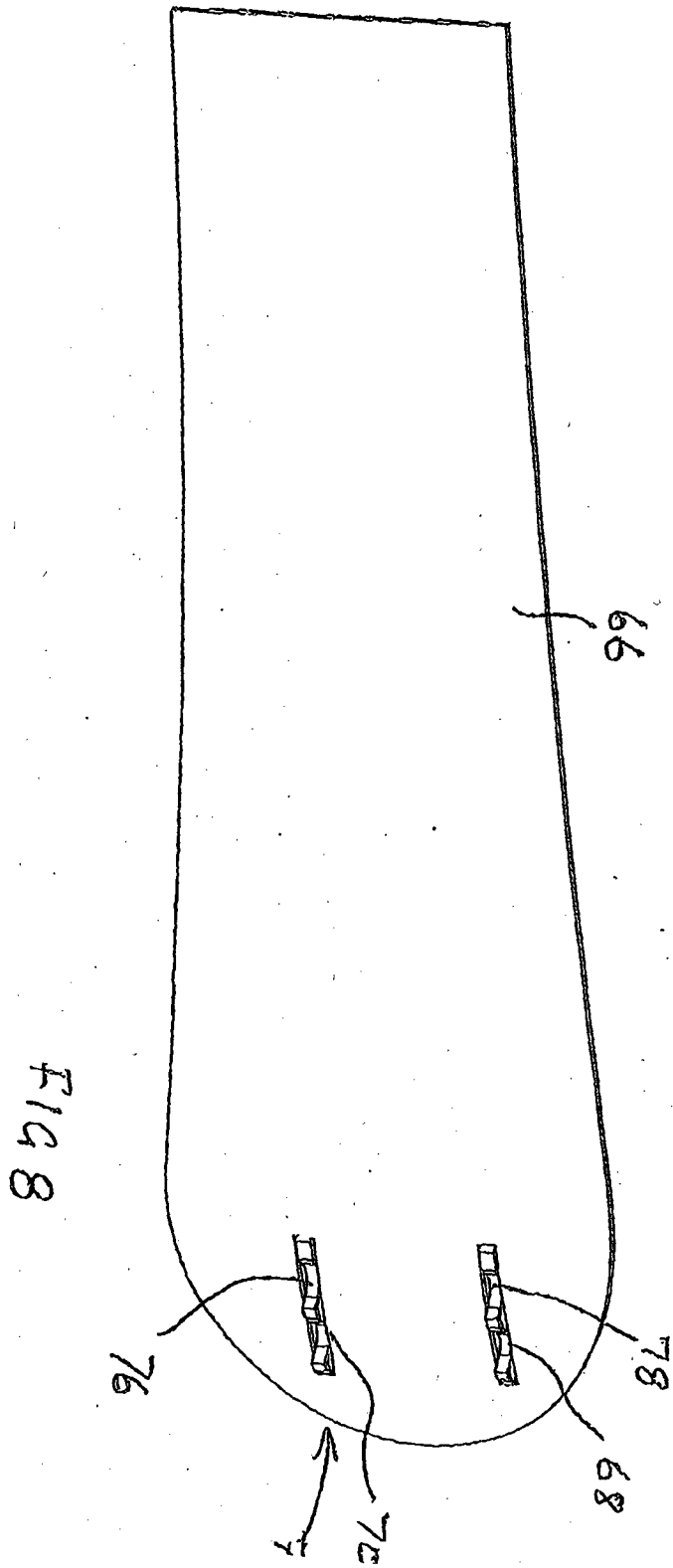


Fig 8

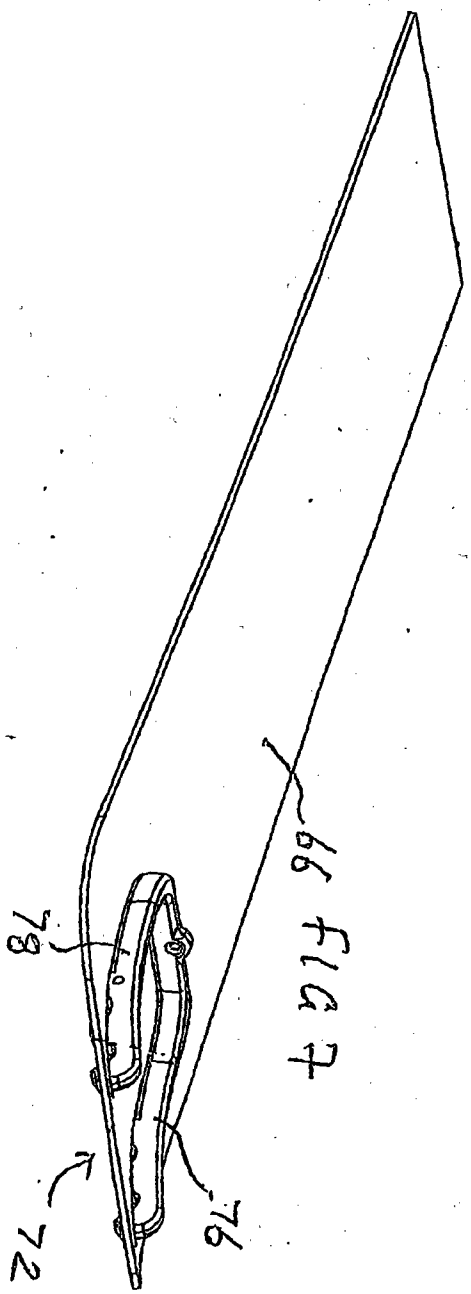


Fig 9

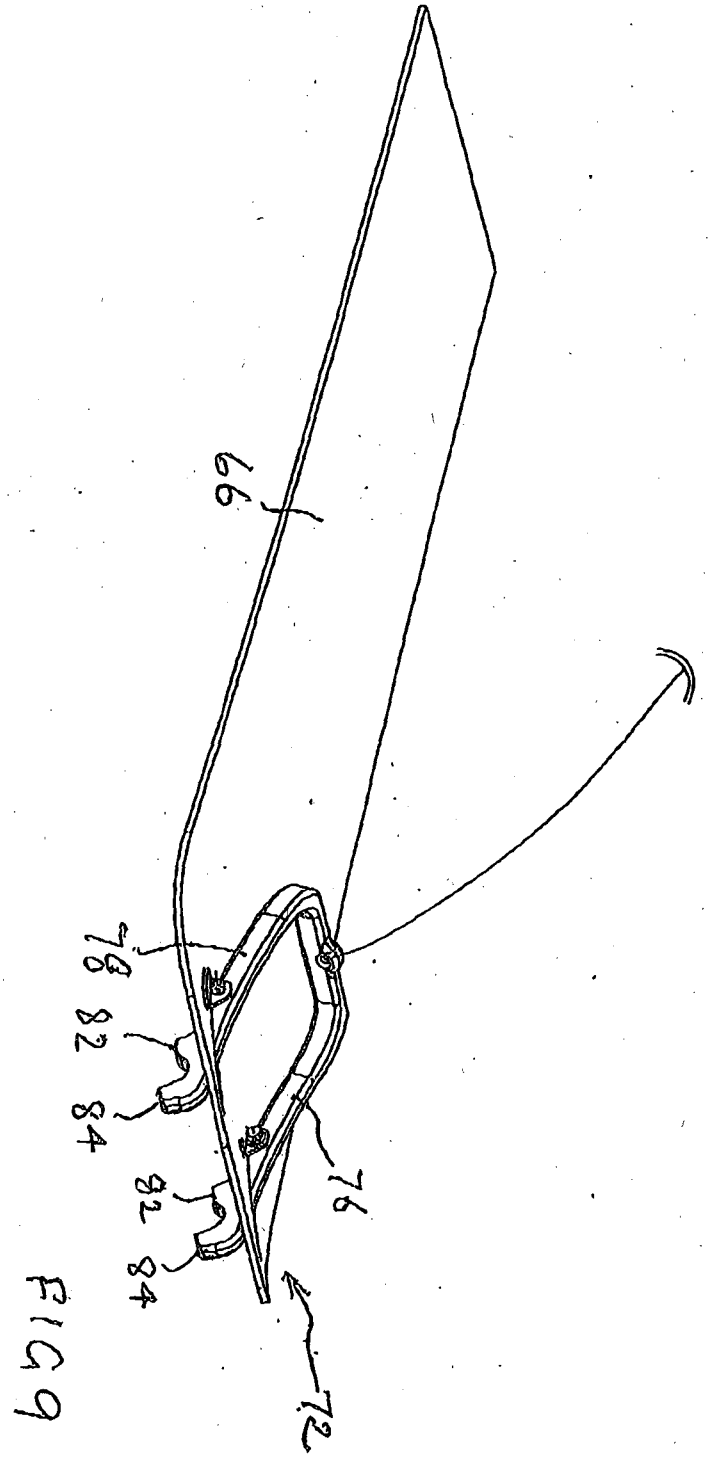


FIG 9

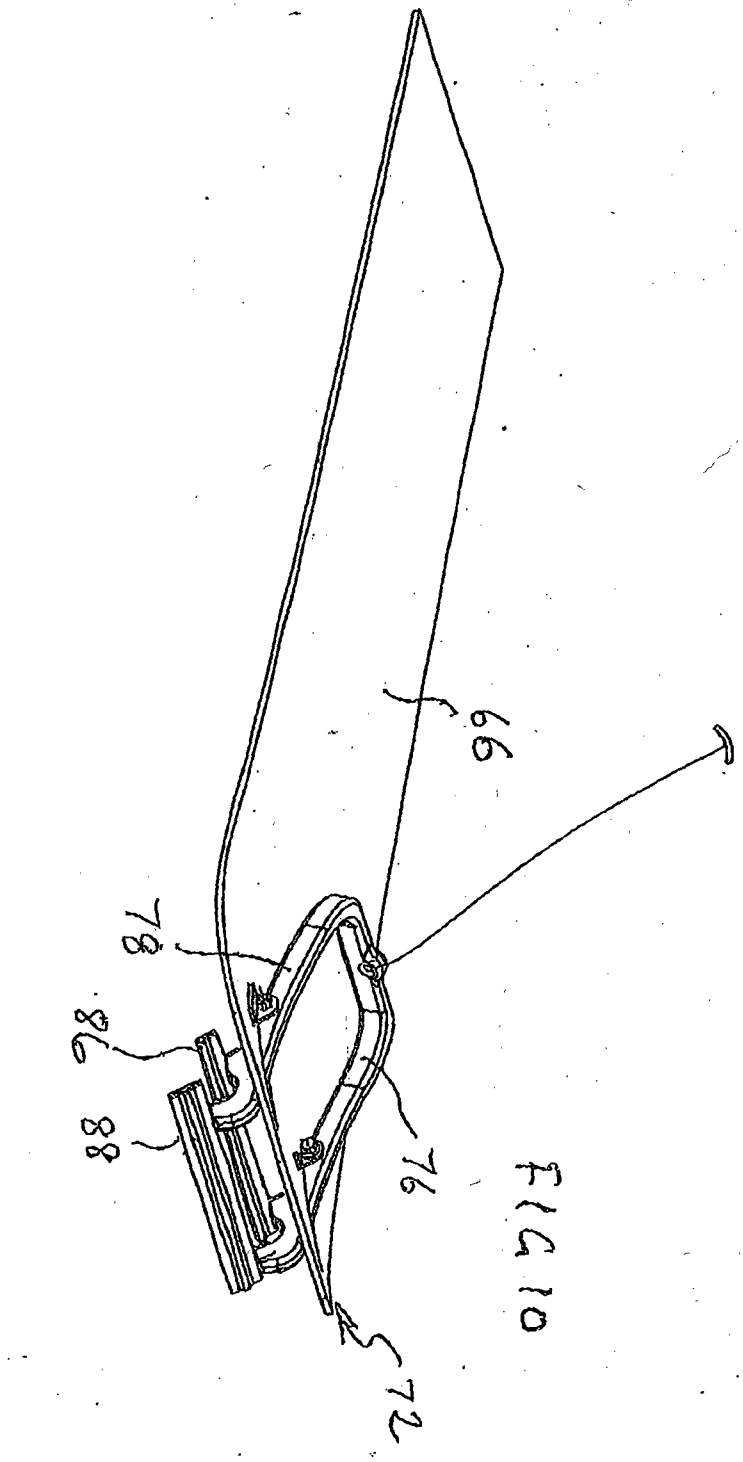


Fig 10

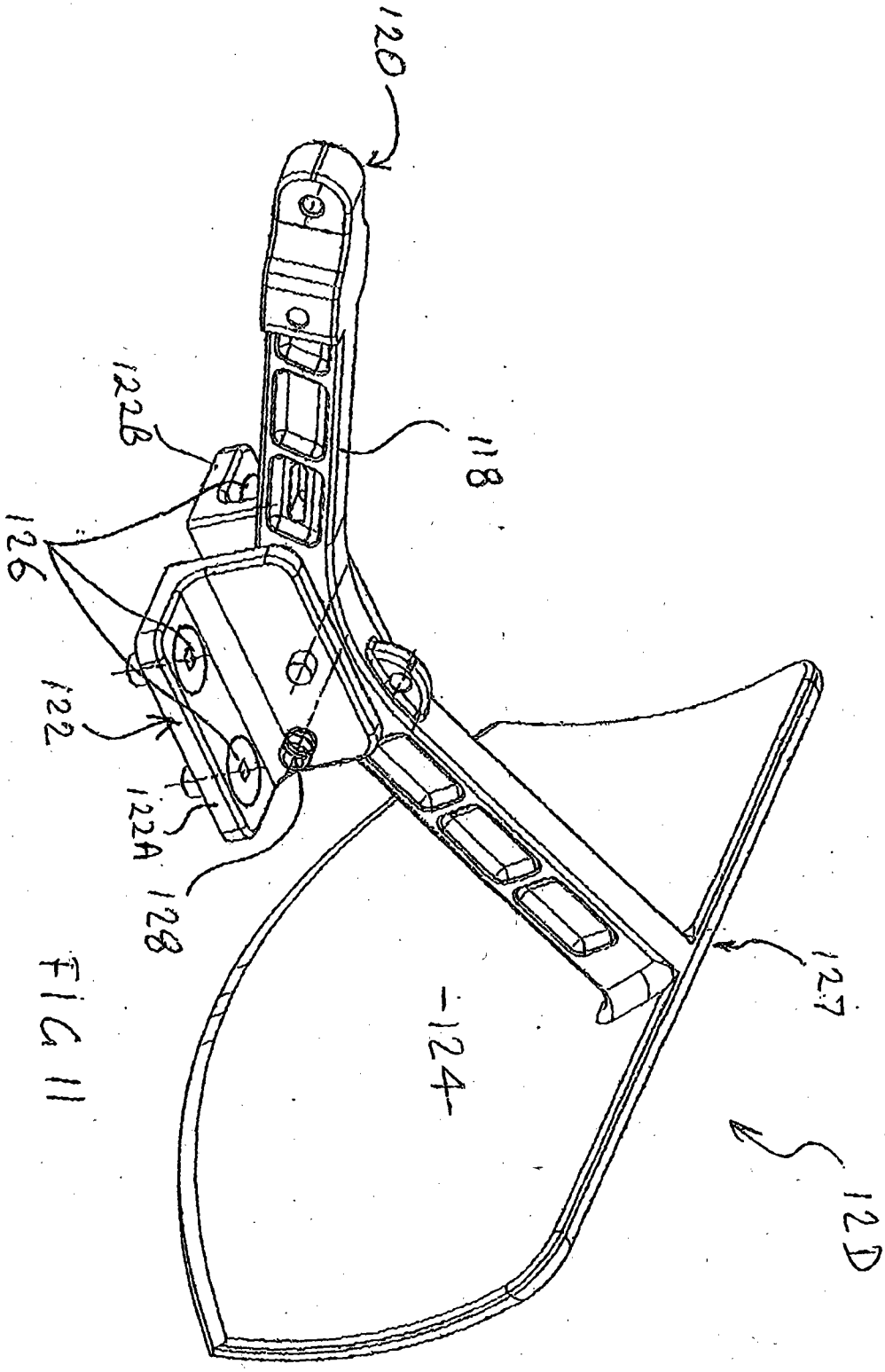


FIG 11

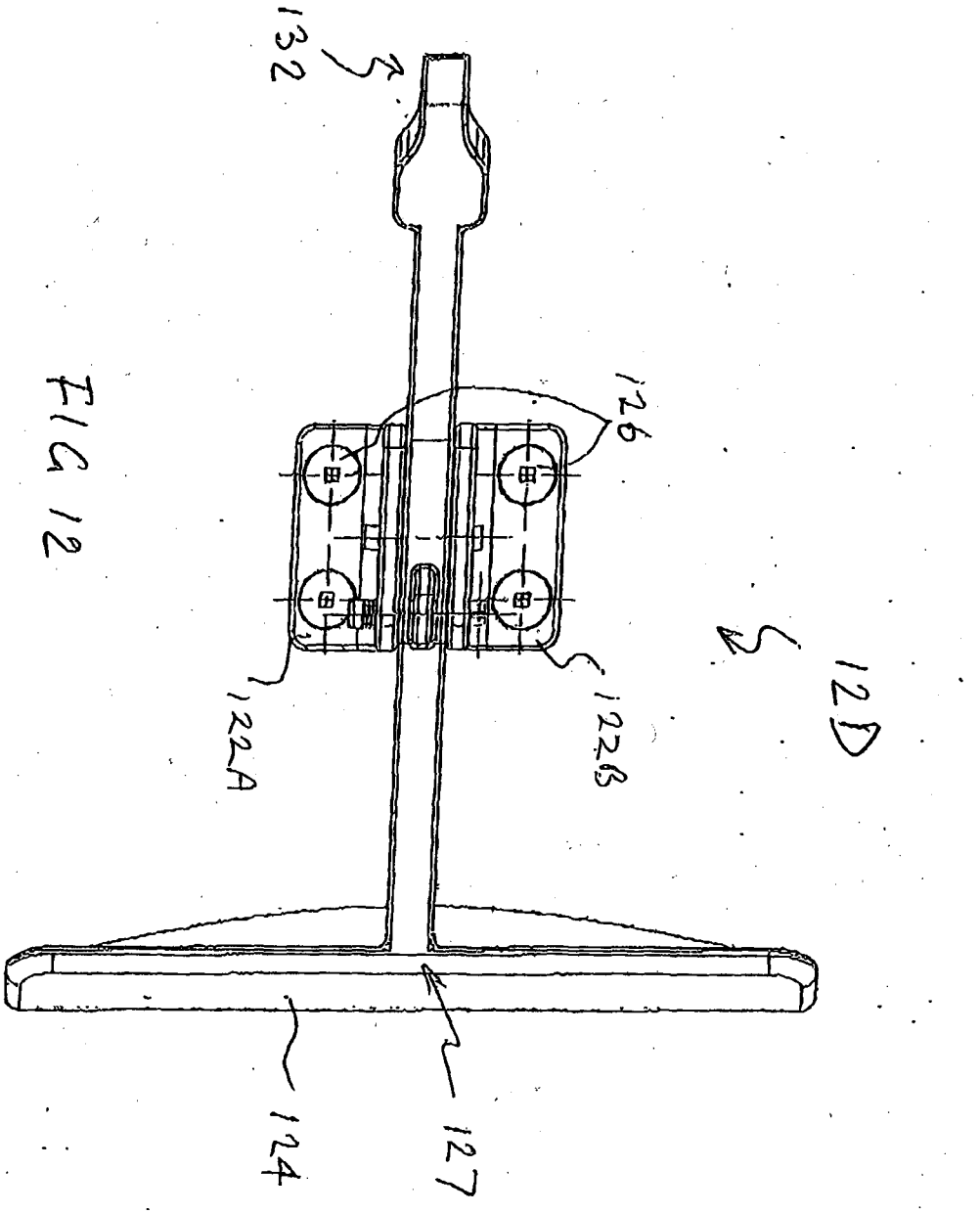


FIG 12

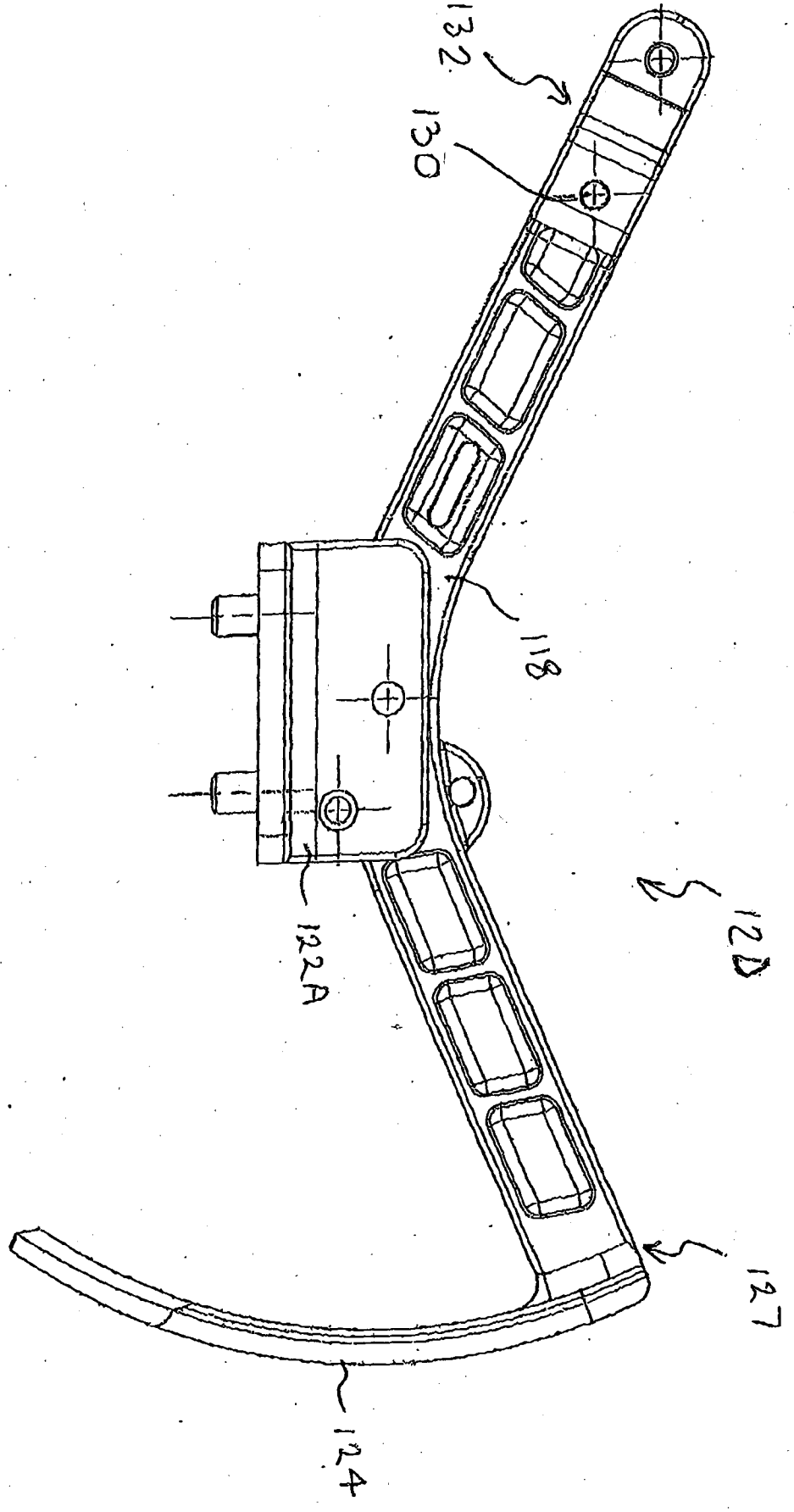


FIG 13

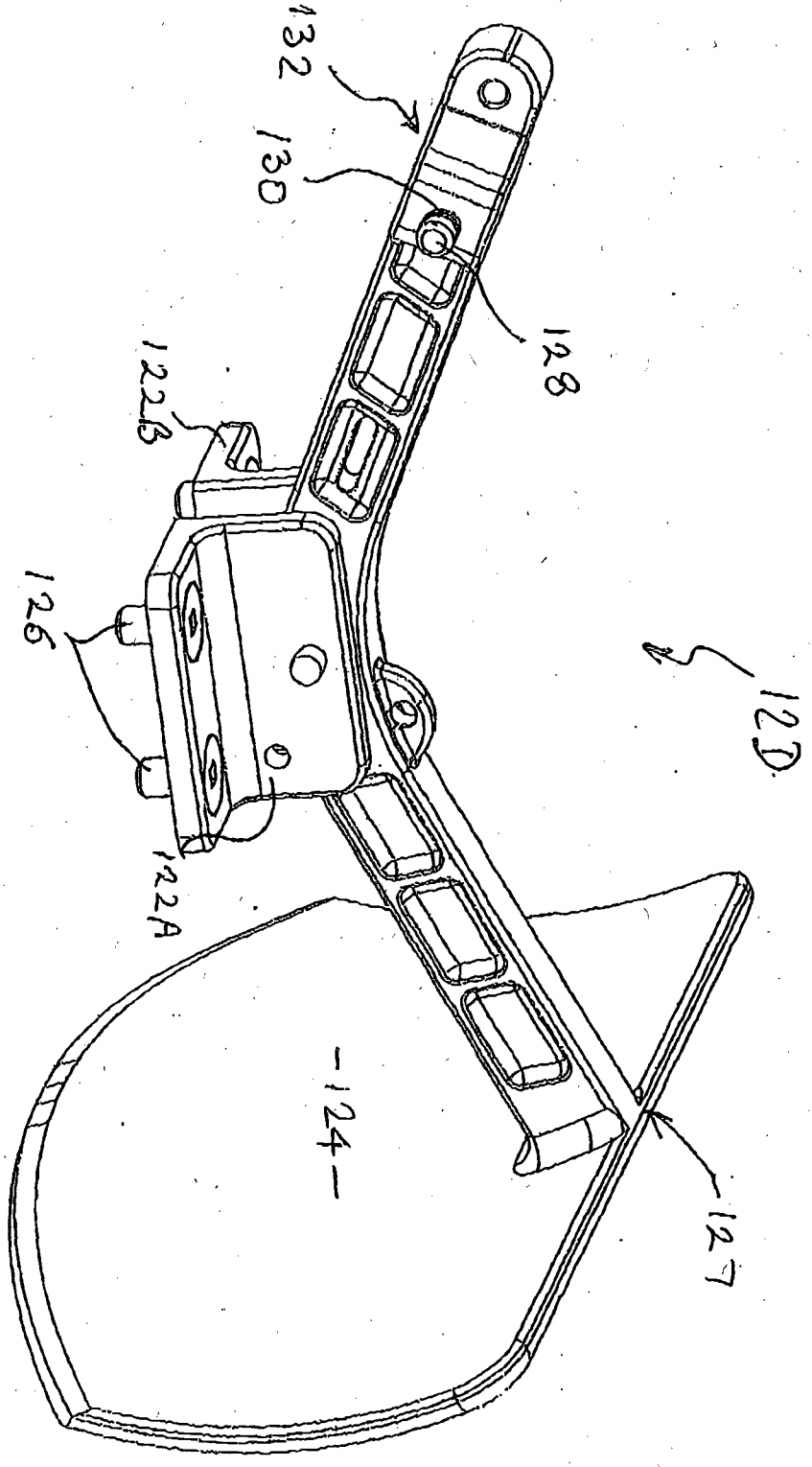


FIG 14

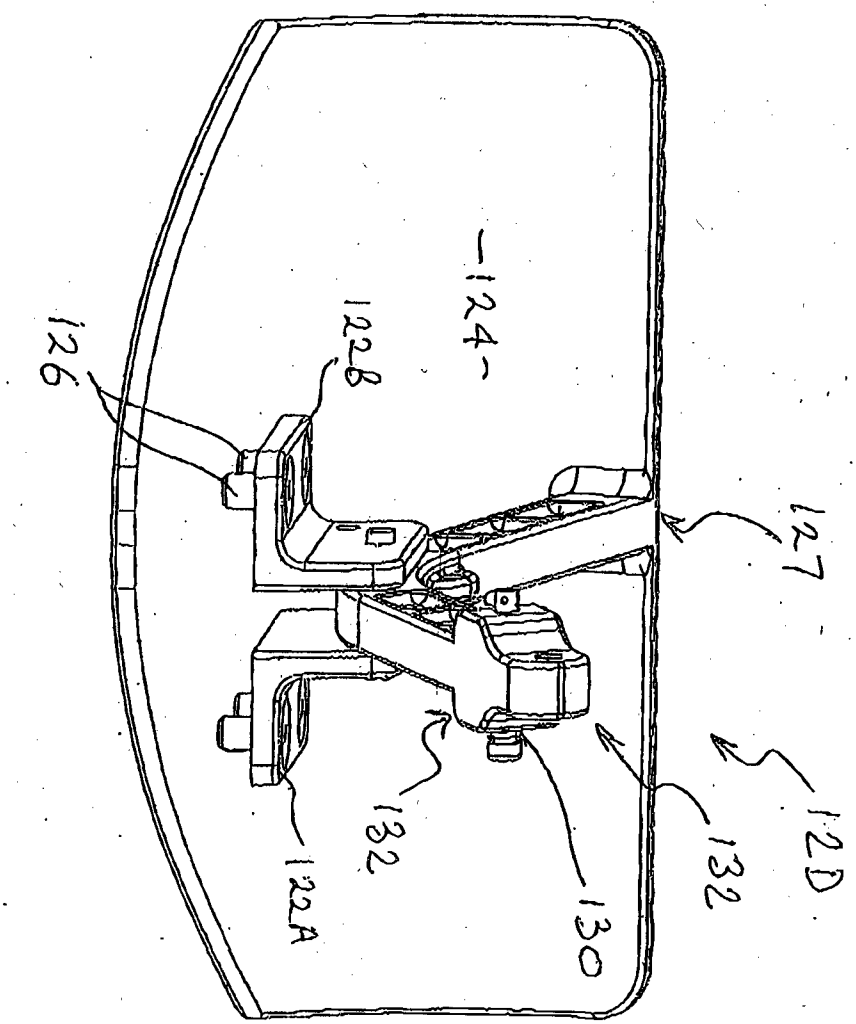


FIG 15

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU2013/000441

A. CLASSIFICATION OF SUBJECT MATTER

A63C 17/14 (2006.01) A63C 5/03 (2006.01) B62M 1/00 (2010.01)

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)

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)

EPODOC, WPI keywords: Skateboard, Riding Board, Snowboard, Brake, Stop, Tether, Cable, Plough, Blade and similar terms; Google Patents / FreePatentsOnline: Brake, Stop, Skateboard, Riding Board, Snowboard, Lever, Handle, Tether, Cable, Activate, Actuate and similar terms

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	Documents are listed in the continuation of Box C	

[X] Further documents are listed in the continuation of Box C [X] 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	Date of mailing of the international search report
17 July 2013	17 July 2013

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INTERNATIONAL SEARCH REPORT C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		International application No. **PCT/AU2013/000441**
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2002/0043777 A1 (IRETON) 18 April 2002 Abstract; figures 1, 2; page 2, paragraph 0038 - page 3, paragraph 0040	1-7, 14-16, 22, 25, 26
X	US 6123348 A (MILLER) 26 September 2000 Abstract; figures 1-4; column 2, lines 39-56; column 5, line 19 - column 8, line 47	1-26, 28, 29, 31, 32, 38
X	US 5020621 A (MARTIN) 04 June 1991 Abstract; figures 1, 5; column 3, line 31 - column 4, line 2	1-7, 14
X	US 4076266 A (KRAUSZ) 28 February 1978 Abstract; figures 1, 2; column 1, lines 33-62; column 2, line 20 - column 4, line 37	1-7, 14
P,X	US 2013/0093151 A1 (FALANGA ET AL) 18 April 2013 Figures 1-5; page 1, paragraph 0018; page 2, paragraph 0029; page 3, paragraph 0061 - page 4, paragraph 0065	1-7, 14, 23, 24

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU2013/000441

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.: **39**
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:
See Supplemental Box

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	International application No. PCT/AU2013/000441

Supplemental Box

Continuation of **Box II**

The claim does not comply with Rule 6.2(a) because it relies on references to the description and/or drawings.

INTERNATIONAL SEARCH REPORT Information on patent family members	International application No. **PCT/AU2013/000441**

This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document/s Cited in Search Report		Patent Family Member/s	
Publication Number	**Publication Date**	**Publication Number**	**Publication Date**
US 2002/0043777 A1	18 Apr 2002	US 6488296 B2	03 Dec 2002
US 6123348 A	26 Sep 2000	US 6123348 A	26 Sep 2000
US 5020621 A	04 Jun 1991	None	
US 4076266 A	28 Feb 1978	None	
US 2013/0093151 A1	18 Apr 2013	WO 2013059311 A2	25 Apr 2013

End of Annex

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.