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(54) Title: PERSONAL TRANSPORTATION DEVICE FOR SUPPORTING A USER'S FOOT

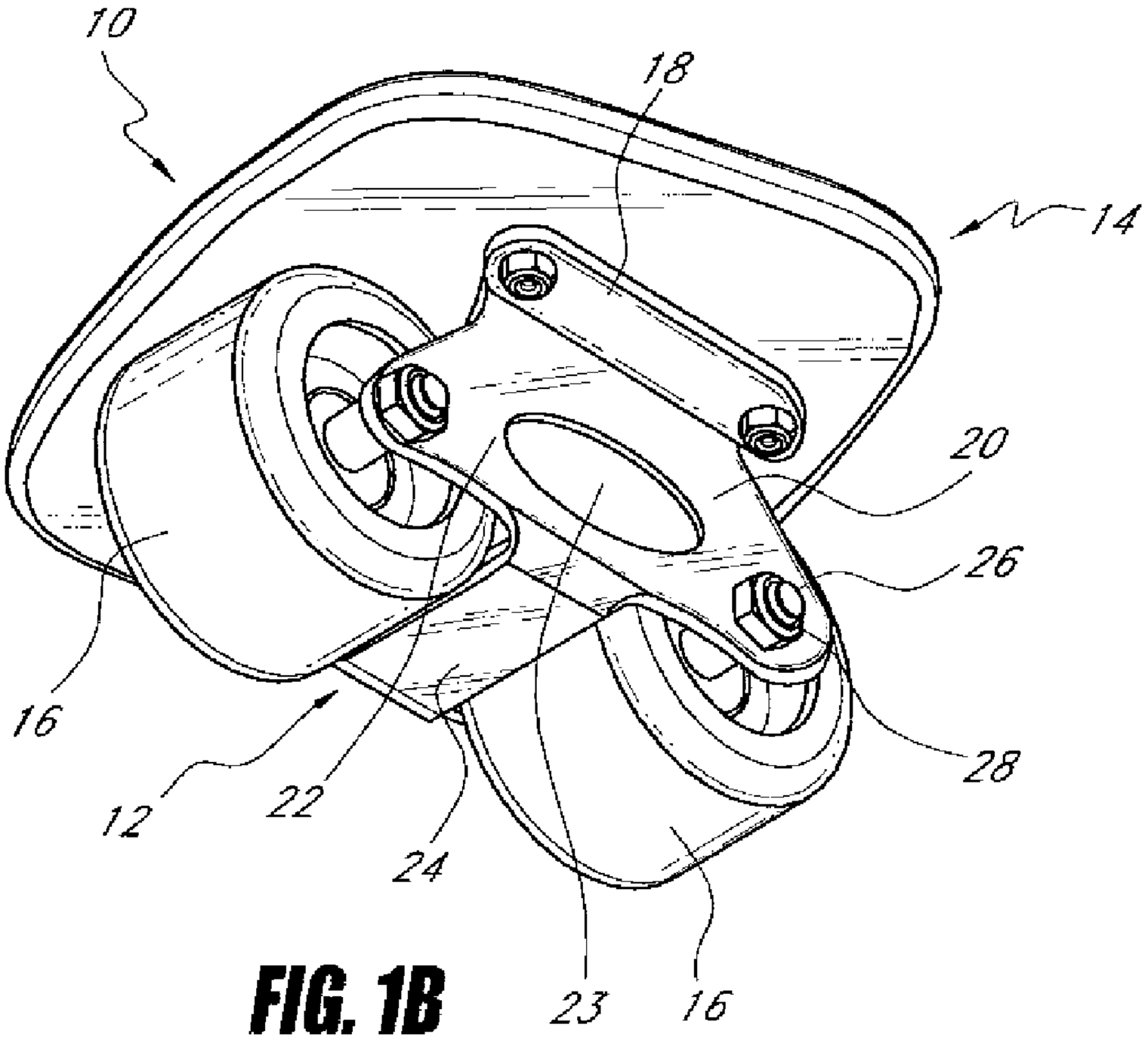

FIG. 1B

(57) Abrégé/Abstract:
A personal transportation device (10, 110) is described having a U-shaped truck (12, 112), a pair of wheels (16, 116) attached to the truck, and a platform (14, 114) mechanically coupled to the truck, such that the platform is operable to receive a user's foot. The personal transportation device (10, 110) can further include an additional pair of easily removable wheels (146), and can be propelled by a rider swiveling his or her hips back and forth to cause the device to move in a targeted direction.

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[Continued on next page]

(54) **Title**: PERSONAL TRANSPORTATION DEVICE FOR SUPPORTING A USER'S FOOT

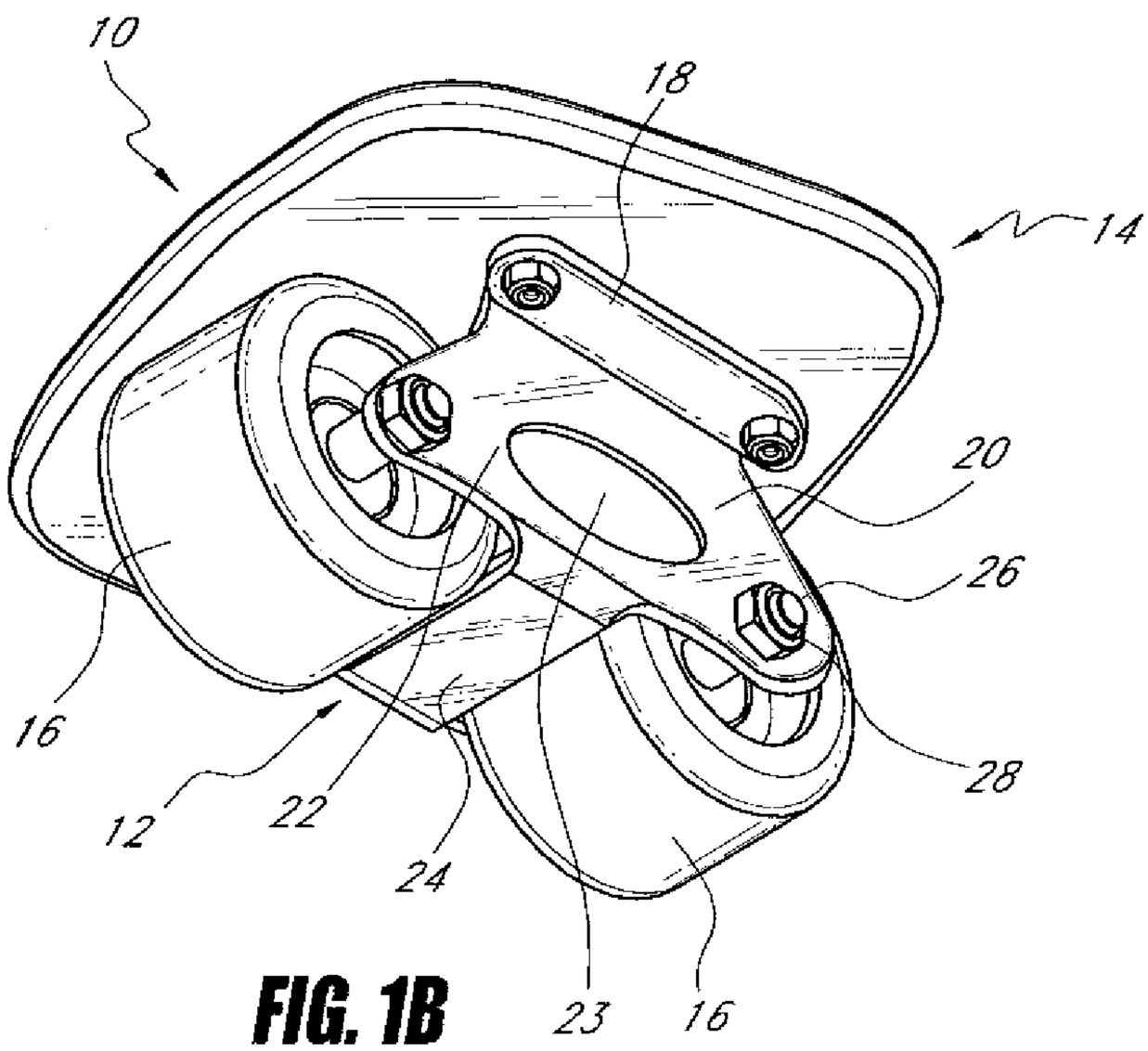

FIG. 1B

(57) **Abstract**: A personal transportation device (10, 110) is described having a U-shaped truck (12, 112), a pair of wheels (16, 116) attached to the truck, and a platform (14, 114) mechanically coupled to the truck, such that the platform is operable to receive a user's foot. The personal transportation device (10, 110) can further include an additional pair of easily removable wheels (146), and can be propelled by a rider swiveling his or her hips back and forth to cause the device to move in a targeted direction.

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PERSONAL TRANSPORTATION DEVICE FOR SUPPORTING A USER'S FOOT

RELATED APPLICATIONS

[0001] This application claims benefit under 35 U.S.C. § 119(e) to U.S. Provisional Patent Application No. 61/052,921, filed May 13, 2008, which is incorporated in its entirety by reference herein. U.S. Provisional Patent Application No. 61/019,796, filed January 8, 2008, U.S. Patent Application No. 12/350,864, filed January 8, 2009, U.S. Patent No. 7,059,613, and U.S. Patent Application No. 11/386,822, filed March 23, 2006 and published as U.S. Patent Publication No. 2006/0186617, are each made a part of this Application and are incorporated in their entireties by reference herein.

BACKGROUND OF THE INVENTIONS

Field of the Inventions

[0002] The present inventions relate to human-propelled personal transportation devices. More particularly, the present inventions are directed to personal transportation systems that include two parts, each supporting a single foot of a user.

Description of the Related Art

[0003] Many of the currently available extreme sport and personal transportation devices limit acrobatic moves, hamper maneuverability and generally do not fully satisfy specific needs in personal transportation. For example, the traditional skateboard is usually operated with both feet of the rider placed on the deck (e.g., platform) of the skateboard. The skateboard limits the rider's feet to the area of the deck. In-line skates allow the rider the flexibility of propulsion from each foot, but the wheels are bound to the riders foot using a shoe like structure.

[0004] Unlike in-line skates or skateboards, the some newer skate systems include one platform for each foot, neither platform being bound to the rider's foot. This can also be referred to as "non-fixed" skates meaning that the skates are not normally "fixed" to the rider's feet during operation, in contrast to conventional "roller skates" which are normally fixed to a rider's foot with shoe laces, Velcro®, bindings, or the like.

When using a "non-fixed" type skate system, the rider stands transverse to the direction of travel. This type of personal transportation device can be propelled using a

swivel motion in which the position of the rider's feet are cyclically rotated ninety degrees to the direction of travel.

SUMMARY OF THE INVENTIONS

[0008] Another aspect of at least one of the embodiments disclosed herein includes the realization that a personal transportation device can be easily assembled and manufactured using certain designs, such as those including U-shaped configurations.

[0009] Thus, in accordance with at least one embodiment, a personal transportation device can comprise a U-shaped truck comprising an undercarriage having flanges for mounting the U-shaped truck to a platform and arms extending from the flanges, each arm having at least one opening dimensioned to receive a wheel axle, at least one pair of wheels mechanically coupled to the U-shaped truck, and a platform mounted to the flanges.

[0010] In accordance with at least another embodiment, a method of operating a personal transportation device can comprise providing two personal transportation devices each comprising a U-shaped truck, a foot platform mounted to the U-shaped truck, and two wheels mounted in-line to the U-shaped truck, placing a foot on each platform of the personal transportation devices such that each foot is approximately perpendicular to the direction of travel, rotating one's waist in a first direction to create a force in the direction of travel, rotating one's waist in a second direction to create a force in the direction of travel, and alternating rotating one's waist in the first and second directions such that the personal transportation devices move in the direction of travel.

[0011] Another aspect of at least one of the embodiments disclosed herein includes the realization that use of a two-wheeled, non-fixed, personal transportation device can take time to learn, and can require some skill with regard to balance. Thus, providing such a personal transportation device with a set of removable wheels can help a rider become more familiar and comfortable with using the personal transportation device. When the rider reaches that level of skill and comfort, the additional wheel can be removed, allowing the rider to experience the full ranges of movement possible with such a transportation device.

[0012] Thus, in accordance with at least another embodiment, a personal transportation device can comprise a truck comprising an undercarriage for mounting the truck to a platform and arms extending from the undercarriage, each arm having at least one

opening dimensioned to receive a wheel axle, a first pair of wheels mechanically coupled to the truck, the first pair of wheels being in-line, a second pair of wheels releasably coupled to the truck, the second pair of wheels being out-of-line with the first pair of wheels and a platform mounted to the truck, the platform sized to receive a user's foot.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] These and other features and advantages of the present embodiments will become more apparent upon reading the following detailed description and with reference to the accompanying drawings of the embodiments, in which:

[0014] Figure 1A is a side elevational view of an embodiment of a personal transportation device.

[0015] Figure 1B is a bottom perspective view of the personal transportation device of Figure 1A.

[0016] Figure 1C is a top plan view of the personal transportation device of Figure 1A.

[0017] Figure 1D is a front elevational view of the personal transportation device of Figure 1A.

[0018] Figure 2 is an exploded perspective view of the personal transportation device of Figure 1A.

[0019] Figure 3 is an enlarged perspective view of the truck of the personal transportation device of Figure 1A.

[0020] Figure 4A is a side elevational view of a rider on the two of the personal transportation devices of Figure 1A.

[0021] Figure 4B is a schematic illustration of an embodiment of the direction of travel of the personal transportation devices shown in Figure 4A.

[0022] Figure 4C is a perspective view of a rider on the two personal transportation devices of Figure 4A.

[0023] Figure 5A is a bottom perspective view of another embodiment of a personal transportation device, including a set of training wheels.

[0024] Figure 5B is a side elevational view of the personal transportation device of Figure 5A.

[0025] Figure 5C is a front elevational view of the personal transportation device of Figure 5A.

[0026] Figure 6 is an exploded perspective view of the personal transportation device of Figure 5A.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0027] With reference to Figures 1A-D, the personal transportation device 10 can comprise a U-shaped truck 12. The U-shaped truck 12 can be connected to a platform 14 that supports a rider's foot, and can further be connected to a pair of wheels 16.

[0028] The U-shaped truck 12 can comprise an undercarriage 18. The undercarriage 18 can comprise, for example, a pair of flanges extending substantially parallel to a bottom portion of the platform 14. The flanges can be attached to and support the U-shaped truck against the platform, such that weight placed on the platform by a rider's foot can be dispersed to the flanges of the undercarriage 18 and supported by the U-shaped truck 12.

[0029] The U-shaped truck 12 can further comprise a frame 20. The frame 20 can extend from the undercarriage 18 and can comprise at least one arm 22. The arms 22 can have a generally semi-hourglass shaped design that provides effective support and an enhanced riding experience. The arms 22 can include an opening, or void, 23, which can help to reduce the weight and material used in manufacturing the personal transportation device 10, while still providing proper support.

[0030] With reference to Figure 1B, the frame 20 can further comprise a bridge 24 extending between the arms 22. The bridge 24 can have a width, measured along an axis of rotation of a wheel 16, greater than the width of the wheel 16, such that the bridge 24 and arms 22 act to at least partially enclose the wheels 16 within the U-shaped truck 12.

[0031] With reference to Figures 1A, 1B, and 2, the frame 20 can further comprise at least one opening 25 configured to receive a wheel axle 26. One method of assembling the personal transportation device 10 can comprise first placing the wheels 16 within the U-shaped truck 12 and inserting wheel axles 26 through the wheels 16. The fasteners 28, such as for example nuts, and spacers 30 can then be attached to the wheel axles 26.

[0032] With continued reference to Figure 2, the platform 14 can then be attached to the U-shaped truck 12. The platform 14 can be multilayered, as indicated by a base layer 32, a deck layer 34, and a skid layer 36, all in parallel planes. In some embodiments, the skid layer 36 can be optional and removable to provide an improved riding experience to the user of the device 10. In some embodiments, at least one of the layers of the platform 14 can be detachable. In some embodiments, at least one of the layers can be comprised of wood. In some embodiments, at least one of the layers can be comprised of rubber. The platform 14 can be attached to the undercarriage 18 by threading deck fasteners 38 through deck shafts and attaching deck nuts 40. With reference to Figure 3, prior to assembly, such as for example during manufacturing, the U-shaped truck 12 can be bent along bend lines 42 to create the undercarriage 18 flanges described above. In some embodiments, the truck 12 can be bent such that the flanges of the undercarriage 18 are substantially perpendicular to the arms 22.

[0033] With reference to Figures 1C and 4A-C, a rider can stand on top of two personal transportation devices 10, with one foot placed on each of the two platforms 14. Unlike in-line skates or skateboards, in some embodiments the platform 14 for each foot of the rider can not be bound to the rider's foot, and the rider can remove his or her foot from one of the platforms 14 if desired. The rider's foot can be angled along a vector 60 which can allow the rider to be facing in a generally transverse direction relative to the direction of travel of the personal transportation devices 10, as shown for example in Figures 4A and 4C.

[0034] With continued reference to Figure 4A, an angle α between a longitudinal axis of the rider's foot, along vector 60, and the direction of travel along vector 62, can vary. In some embodiments, this angle is typically approximately 74 degrees. Other angles can also be used.

[0035] The personal transportation device can be propelled by the rider using a swivel motion with his or her hips. For example, the rider can swivel his or her hips in a first direction, and then in an opposite direction, repeating this motion again and again and propelling the personal transportation devices 10 through a path similar to that shown in Figure 4B. In some embodiments during use, the rider can turn his or her feet either toes out

or toes in to steer the personal transportation device 10, depending on which direction the rider is swinging his or her waist.

[0036] With reference to Figures 5A-C and 6, another embodiment of a personal transportation device 110 is illustrated. The personal transportation device 110 can comprise a U-shaped truck 112, a platform 114, and wheels 116. In contrast to the personal transportation device 10 described above, the personal transportation device 110 can further comprise two training wheels 146, a training wheel axle 148, and a removable locking member 150, such as for example a pin, which can hold the training wheel axle 148 in place. As shown in Figure 5A, the training wheels 146 can be out of line with the two in-line wheels 116, such that the training wheels offer added stability and support for the personal transportation device 110. In some embodiments, and as described herein, the training wheels 146 can be easily removed and/or added to the personal transportation device 110.

[0037] With reference to Figure 6, the U-shaped truck 112 can be similar to that of the U-shaped truck 12 described above. For example, the U-shaped truck 112 can comprise an undercarriage 118 which can be fastened to the platform 114. The U-shaped truck 112 can further include at least one opening or void 123, which can help to reduce the amount of material and/or weight of the personal transportation device 110.

[0038] In contrast to the U-shaped truck 12, the U-shaped truck 112 can include additional openings 144 in generally a central portion of the U-shaped truck 112. The additional openings 144 can be configured to receive the training wheel axle 148. With reference to Figure 6, the training wheels 116 can be removably attached to the U-shaped truck 112, such that a rider can quickly and easily add or remove the wheels. To add the training wheels 146, the rider can place one of the training wheels 146 along the outside of the U-shaped undercarriage 112 and then insert the training wheel axle 148 first through the training wheel 146 and then through the openings 144. Once the training wheel axle 148 has passed through the U-shaped truck 112, the second training wheel 146 can be placed over the end of the training wheel axle 148, and the locking member 150 can be used to secure the training wheel axle 148 in place within the U-shaped truck 112. In some embodiments, the locking member 150 can comprise a simple locking pin which can slide over an indented

groove on the end of the training wheel axle 148 and inhibit the training wheel 146 from sliding off the end of the training wheel axle 148.

[0039] The training wheels 146 described above can be used with other types of truck configurations and types of personal transportation devices, and are not limited to the U-shaped truck and/or personal transportation devices described herein. Furthermore, while two training wheels 146 and two wheels 16 or 116 are shown in the illustrated embodiments, other numbers and configurations of wheels are also possible. For example, in some embodiments, the personal transportation device 10 or 110 can include three wheels 16 or 116, and/or one training wheel 146.

[0040] The size, shape, width, and/or material of the wheels can also vary. For example, in some embodiments the training wheels 146 can be comprised of a different material, and/or have a different size, than that of the wheels 16 or 116. Additionally, the wheels can be attached to the personal transportation devices 10, 110 in other methods than those described above.

[0041] With continued reference to Figure 6, the personal transportation device 110 can include a grip layer 136 similar to that of grip layer 36 shown in Figure 2. In contrast to the grip layer 36, however, the grip layer 136 can be a clear grip tape. The clear grip tape can be a thin, separate layer which can be adhered to the top of the platform 114, thus covering the tops of the deck fasteners 138 and giving the personal transportation device 110 a more aesthetically pleasing, and smoother appearance.

[0042] Although these inventions have been disclosed in the context of certain preferred embodiments and examples, it will be understood by those skilled in the art that the present inventions extend beyond the specifically disclosed embodiments to other alternative embodiments and/or uses of the inventions and obvious modifications and equivalents thereof. In addition, while several variations of the inventions have been shown and described in detail, other modifications, which are within the scope of these inventions, will be readily apparent to those of skill in the art based upon this disclosure. It is also contemplated that various combinations or sub-combinations of the specific features and aspects of the embodiments can be made and still fall within the scope of the inventions. It should be understood that various features and aspects of the disclosed embodiments can be

combined with or substituted for one another in order to form varying modes of the disclosed inventions. Thus, it is intended that the scope of at least some of the present inventions herein disclosed should not be limited by the particular disclosed embodiments described above.

WHAT IS CLAIMED IS:

1. A personal transportation device comprising:

a U-shaped truck comprising an undercarriage having flanges for mounting the U-shaped truck to a platform and arms extending from the flanges, each arm having at least one opening dimensioned to receive a wheel axle;

at least one pair of wheels mechanically coupled to the U-shaped truck; and

a platform mounted to the flanges.

2. The personal transportation device of Claim 1, wherein each arm comprises a semi hour-glass shape.

3. The personal transportation device of Claim 1, wherein the U-shaped truck comprises a bridge connecting the arms underneath the platform, the bridge forming the bottom of the U-shaped truck.

4. The personal transportation device of Claim 3, wherein the bridge has a width, measured along an axis of rotation of the wheels, greater than the width of one of the wheels.

5. The personal transportation device of Claim 1, wherein the at least one opening comprises three openings.

6. The personal transportation device of Claim 5, wherein three separate wheel axles extend through the three openings, the three wheel axles holding four wheels in place underneath the platform.

7. The personal transportation device of Claim 6, wherein two of the four wheels are removable training wheels.

8. The personal transportation device of Claim 7, wherein the training wheels are held in place by a locking member on one of the wheel axles, the locking member being removable so as to allow the wheel axle and training wheels to be removed from the personal transportation device.

9. The personal transportation device of Claim 1, wherein the flanges have flat surfaces contacting a bottom of the platform.

10. The personal transportation device of Claim 1, wherein each of the arms comprises at least one opening forming an open void in each arm.

11. The personal transportation device of Claim 1, wherein the flanges extend substantially perpendicular to the arms and substantially parallel to the bottom of the platform.

12. The personal transportation device of Claim 1, wherein at least one of the pairs of wheels is in-line.

13. The personal transportation device of Claim 1, wherein the platform comprises a plurality of parallel layers.

14. The personal transportation device of Claim 13, wherein each layer is detachable.

15. The personal transportation device of Claim 13, wherein at least one of the layers is comprised of wood.

16. The personal transportation device of Claim 13, wherein at least one of the layers is comprised of rubber.

17. A method of operating a personal transportation device comprising:

providing two personal transportation devices each comprising a U-shaped truck, a foot platform mounted to the U-shaped truck, and two wheels mounted in-line to the U-shaped truck;

placing a foot on each platform of the personal transportation devices such that each foot is approximately perpendicular to the direction of travel;

rotating one's waist in a first direction to create a force in the direction of travel;

rotating one's waist in a second direction to create a force in the direction of travel; and

alternating rotating one's waist in the first and second directions such that the personal transportation devices move in the direction of travel.

18. The method of Claim 14, further comprising removing a foot from one of the platforms.

19. The method of Claim 14, further comprising turning one's foot toes outwards or toes inwards to steer the personal transportation device, based on the direction one's waist is rotating.

20. A personal transportation device comprising:

a truck comprising an undercarriage for mounting the truck to a platform and arms extending from the undercarriage, each arm having at least one opening dimensioned to receive a wheel axle;

a first pair of wheels mechanically coupled to the truck, the first pair of wheels being in-line;

a second pair of wheels releasably coupled to the truck, the second pair of wheels being out-of-line with the first pair of wheels; and

a platform mounted to the truck, the platform sized to receive a user's foot.

21. The personal transportation device of Claim 20, wherein the second pair of wheels comprises training wheels for the personal transportation device, the training wheels being held in place by a single wheel axle extending through each wheel and the truck.

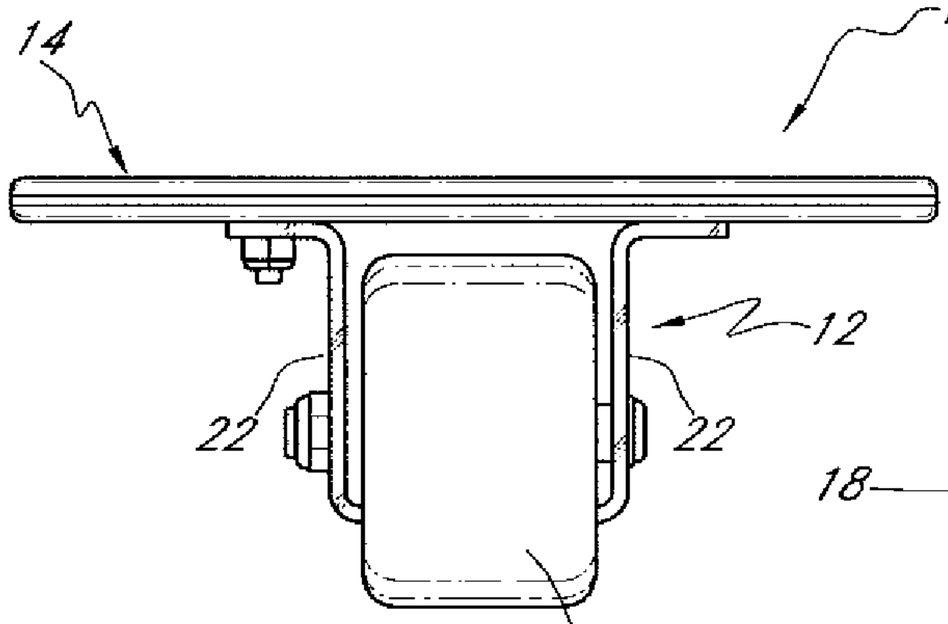

FIG. 1D

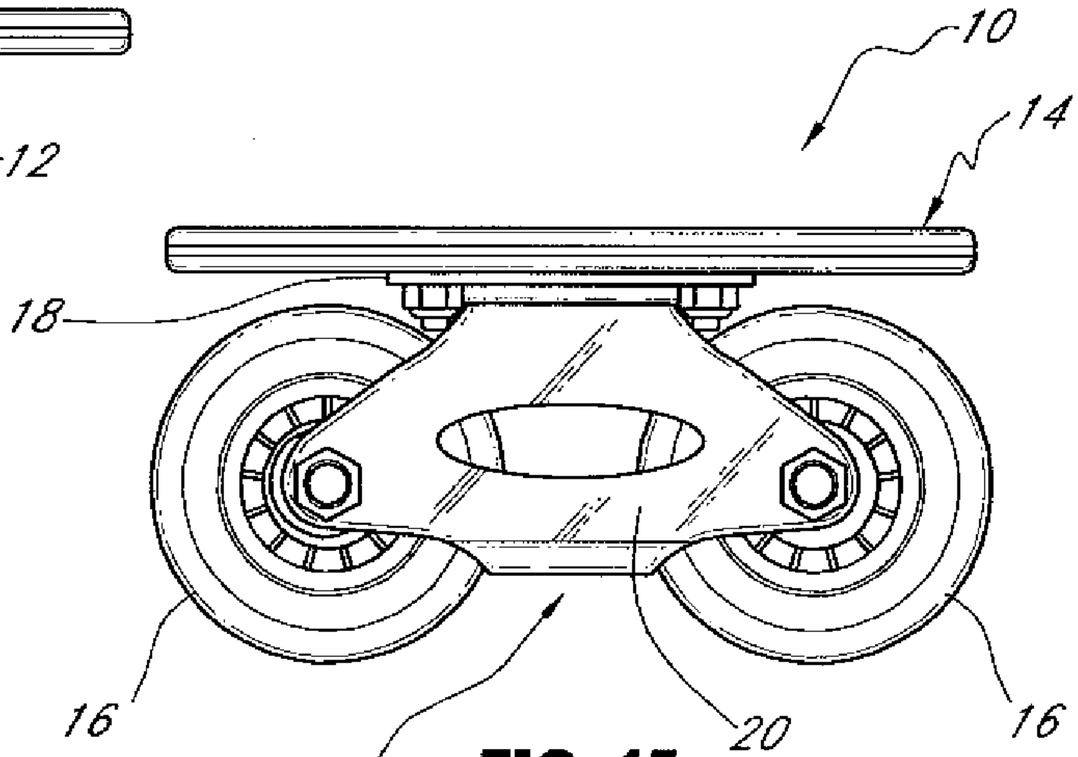

FIG. 1A

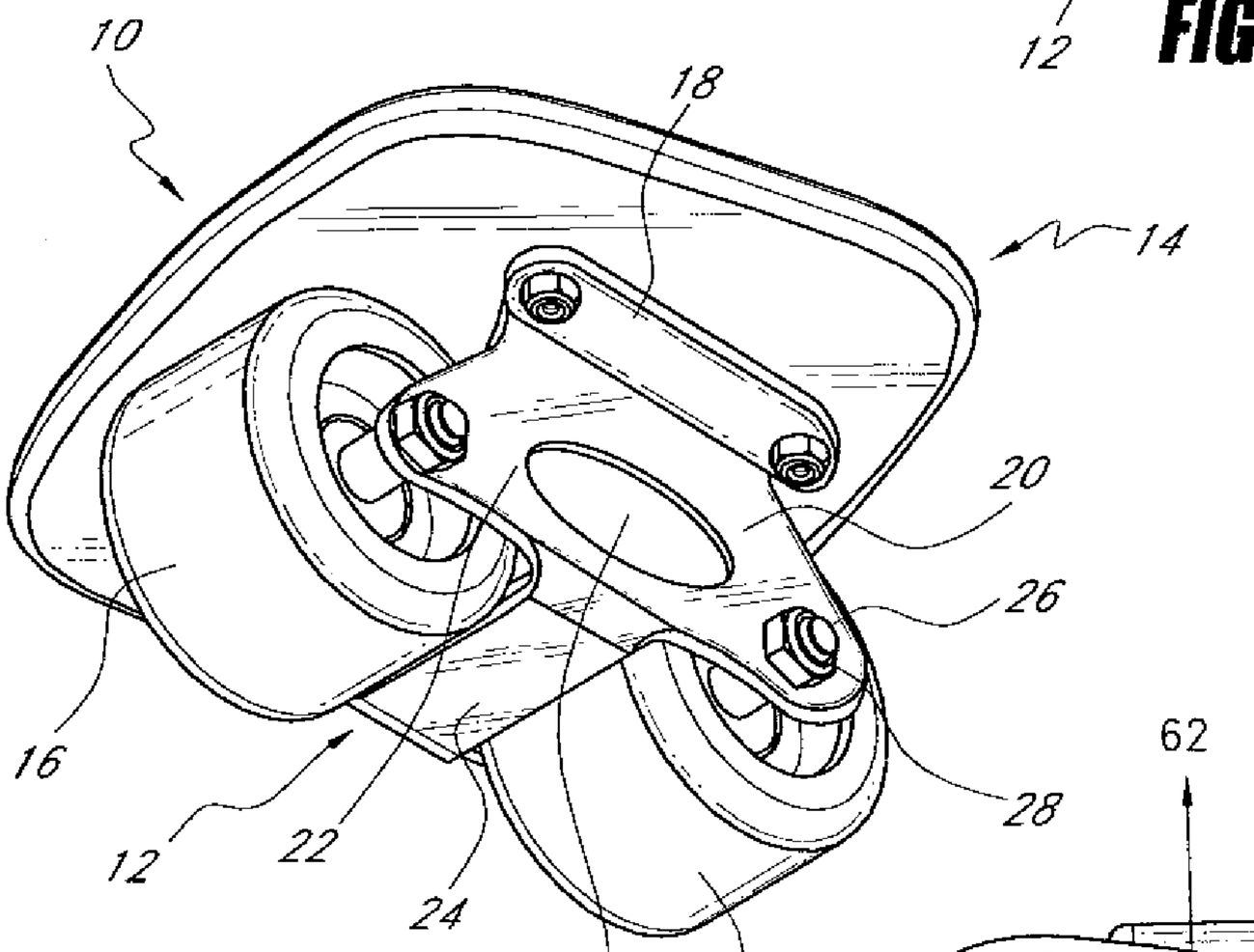

FIG. 1B

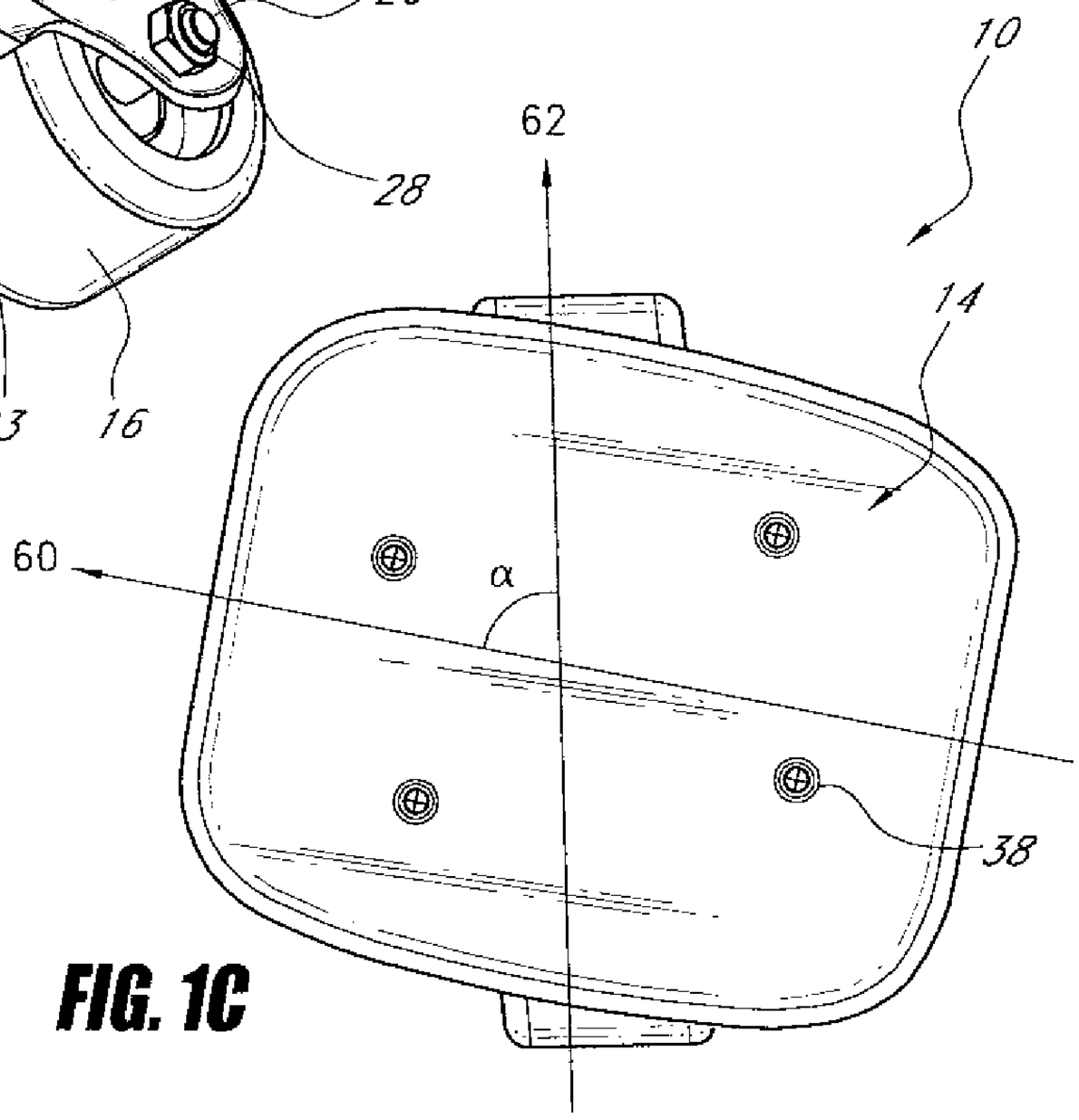

FIG. 1C

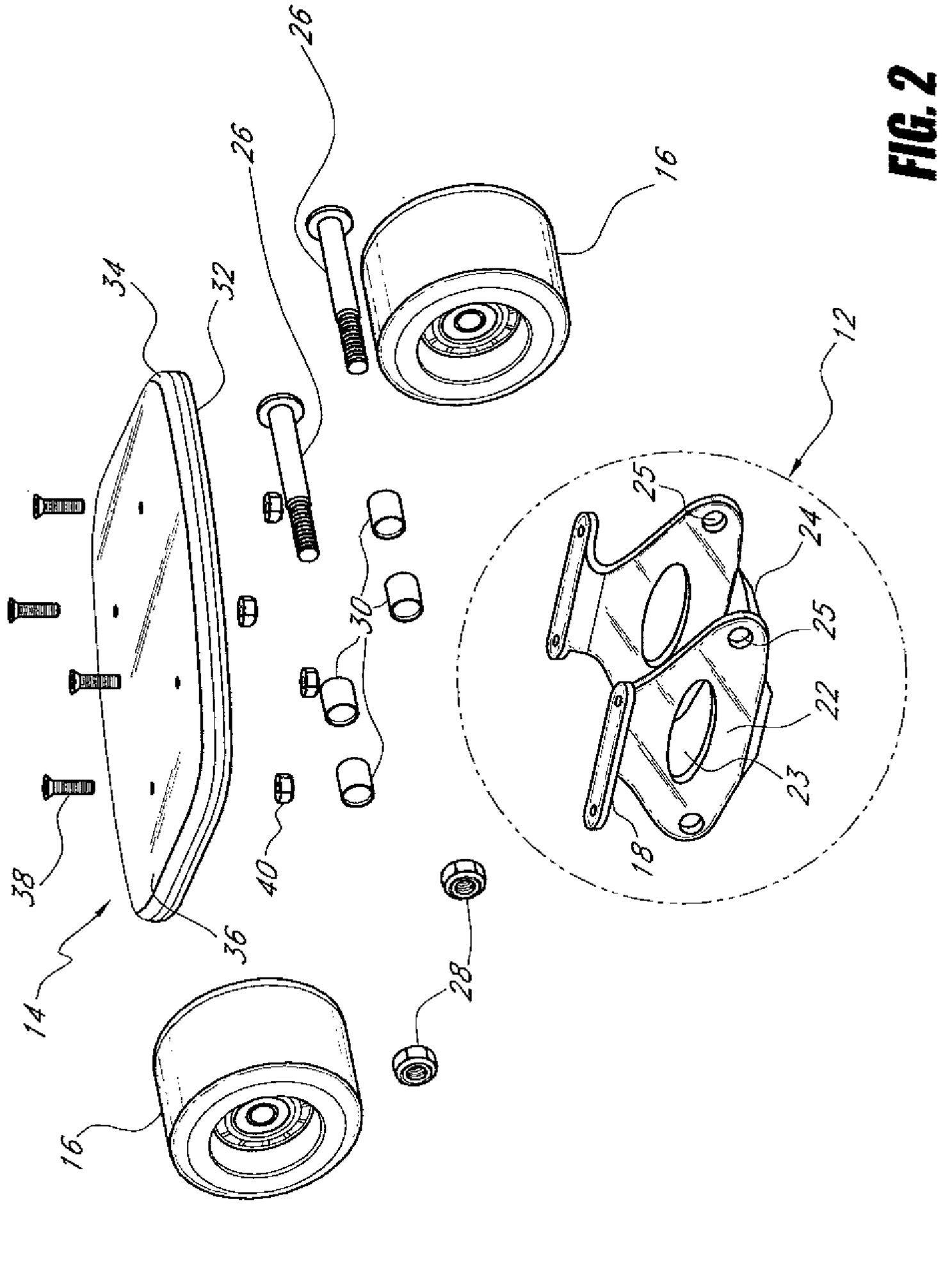

FIG. 2

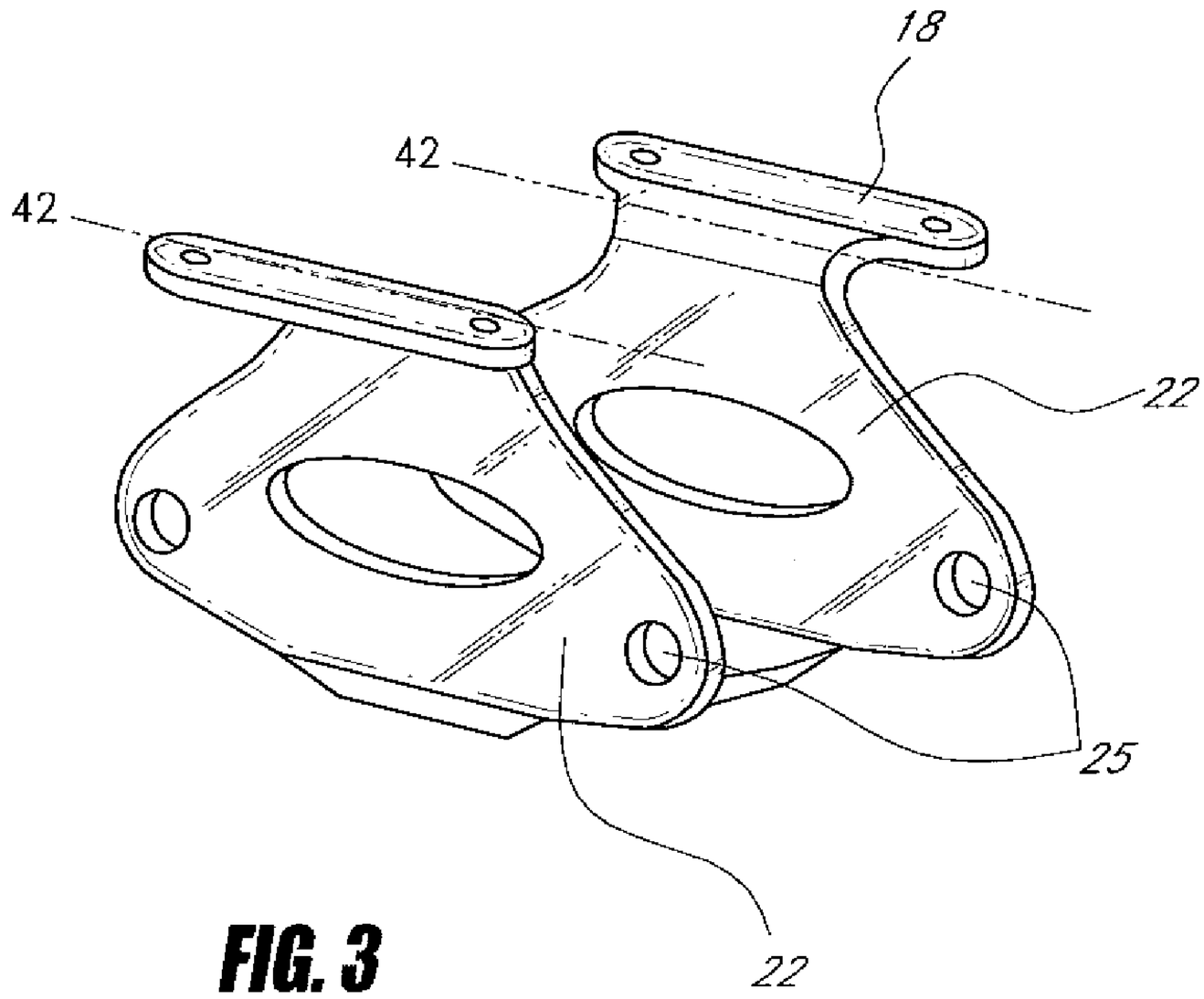

FIG. 3

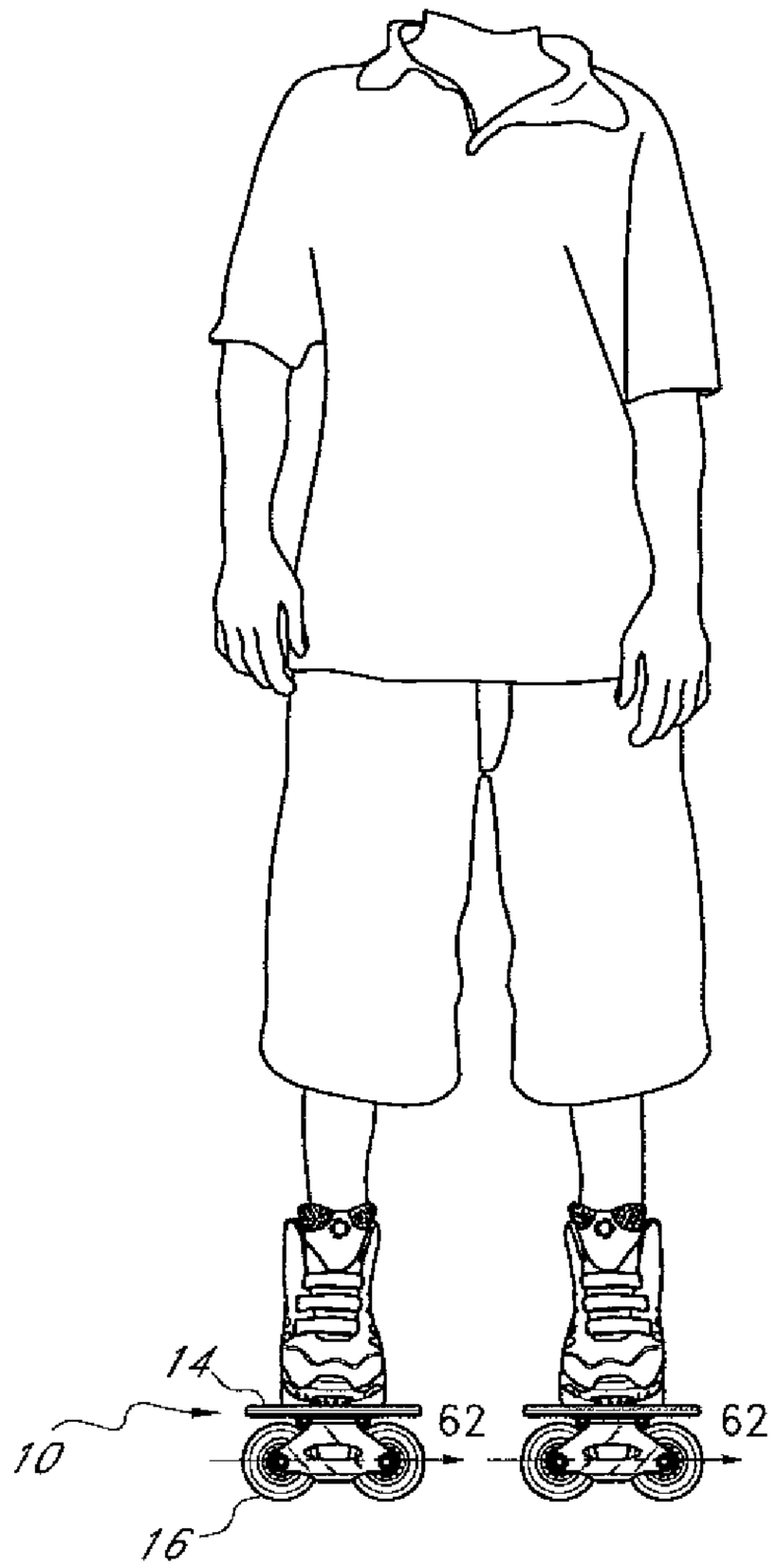

FIG. 4A

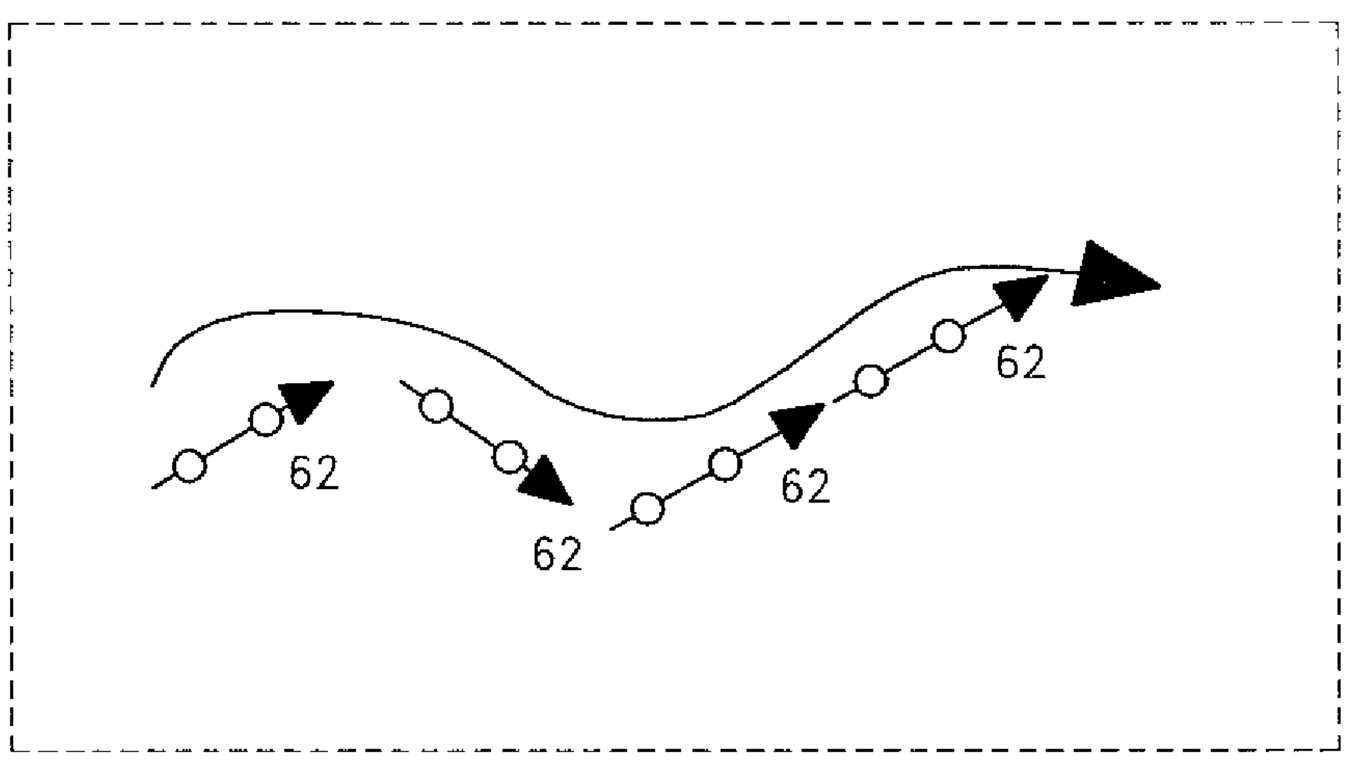

FIG. 4B

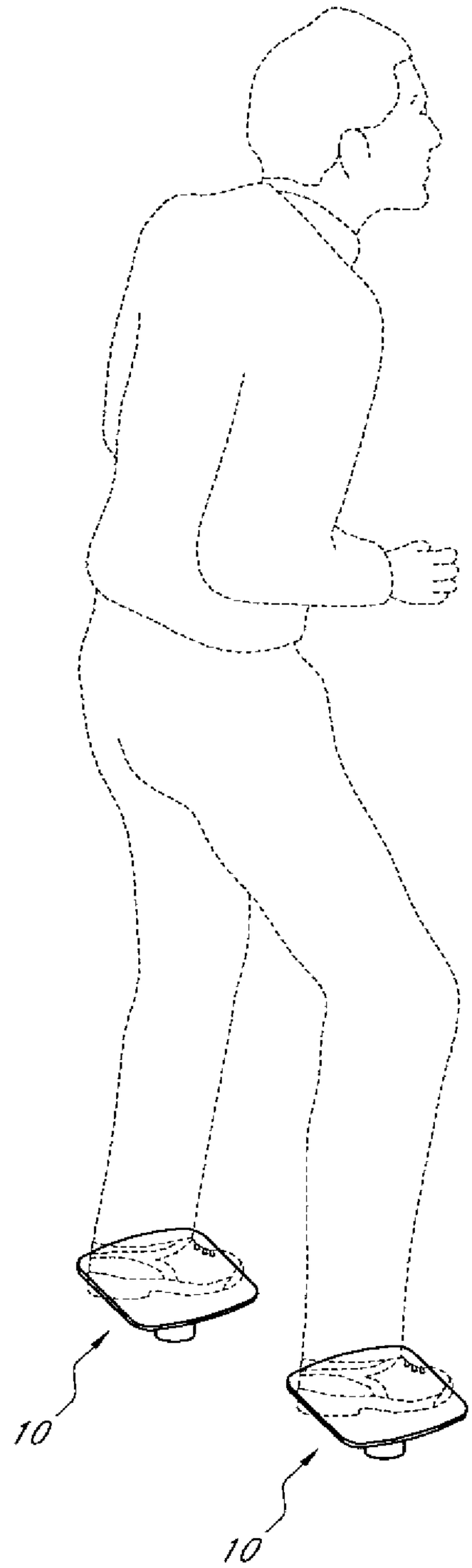

FIG. 4C

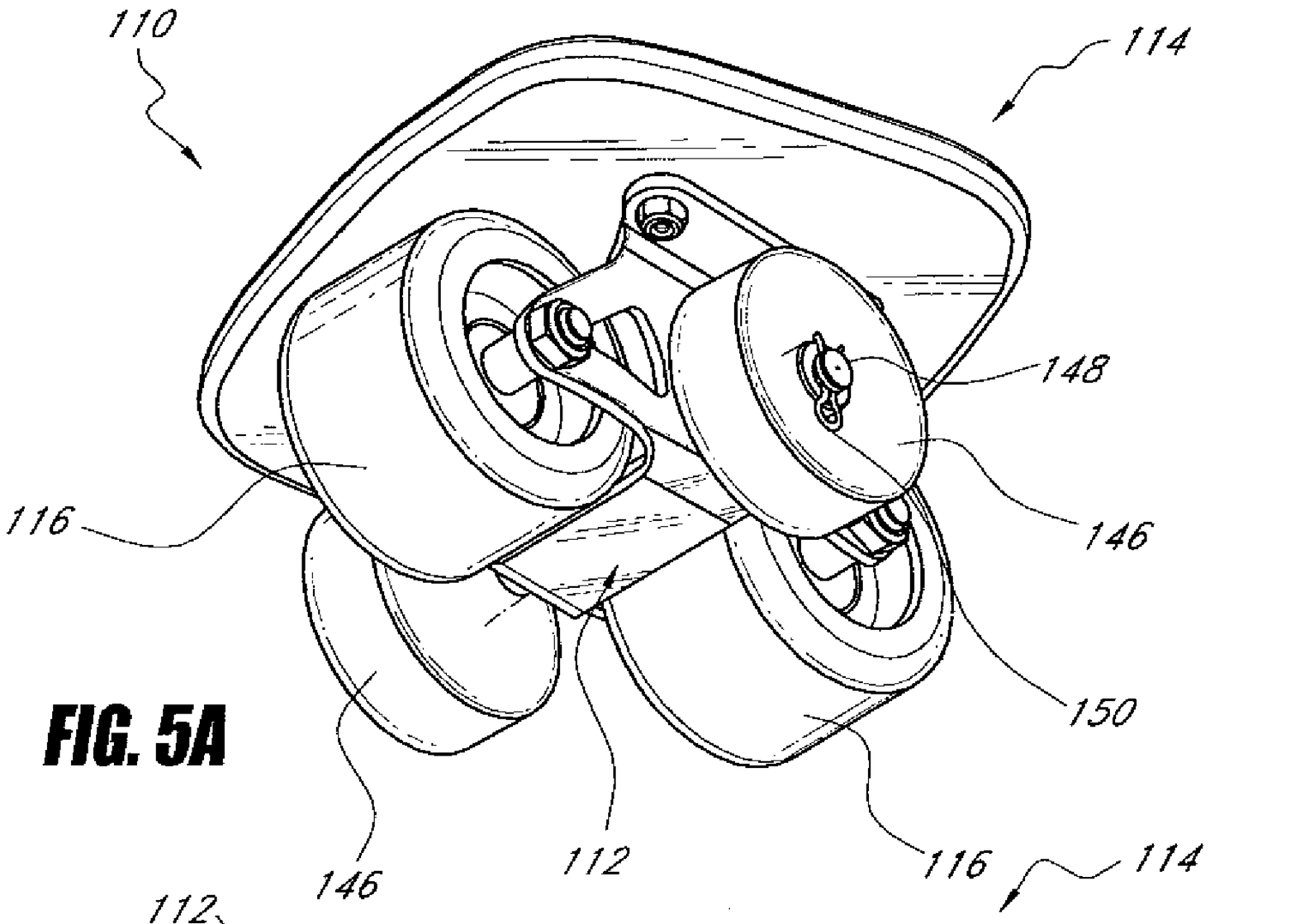

FIG. 5A

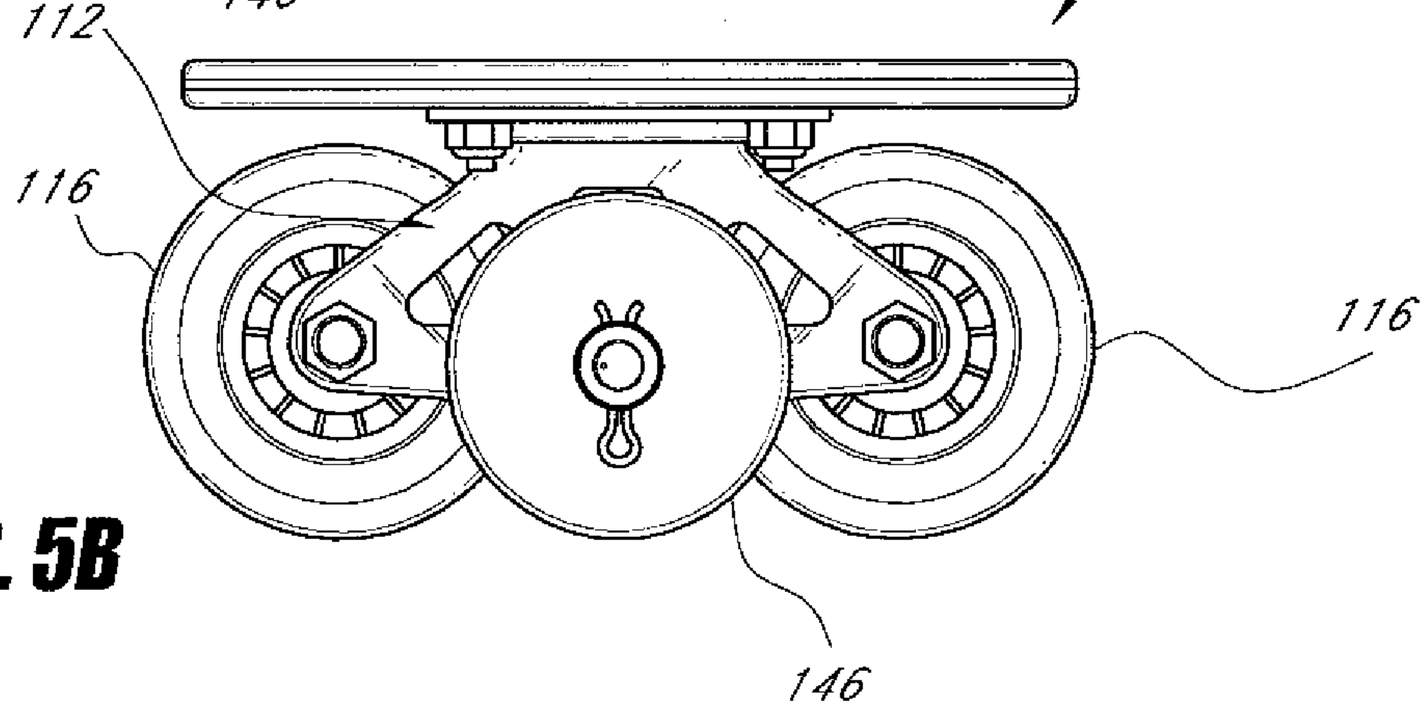

FIG. 5B

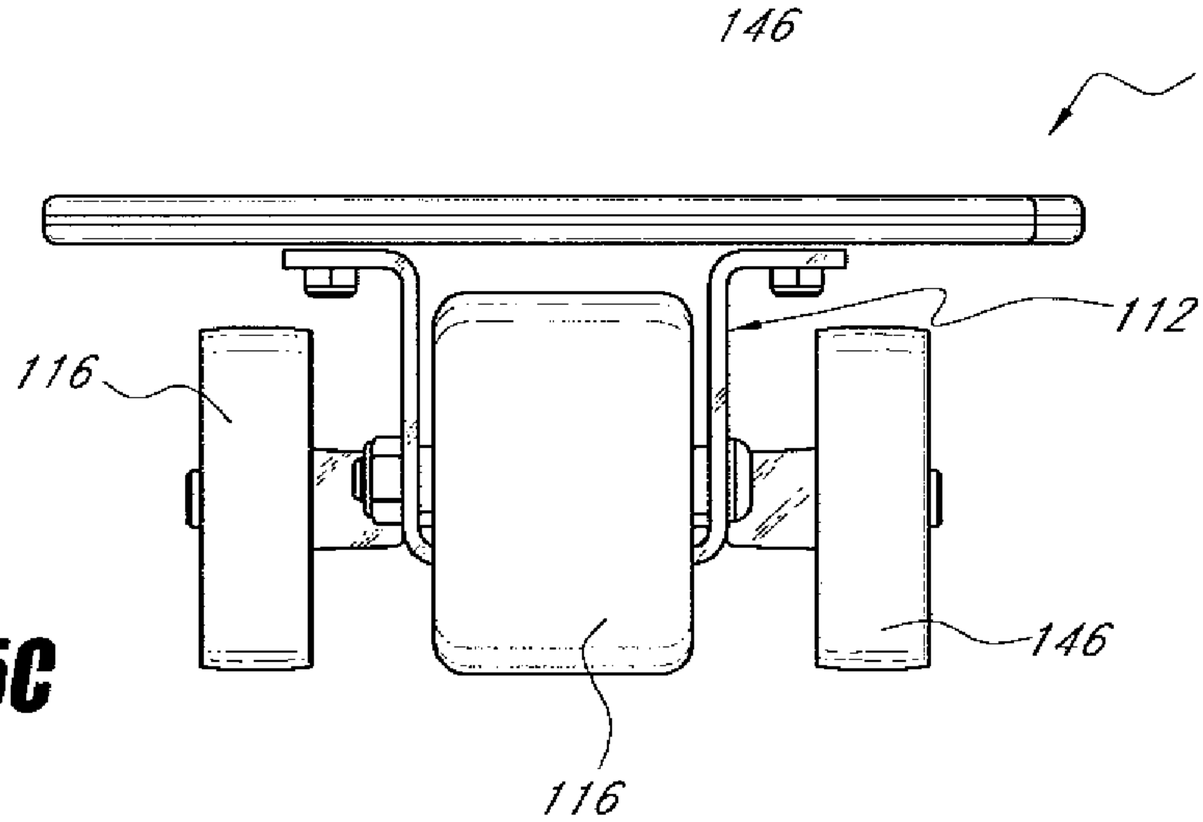

FIG. 5C

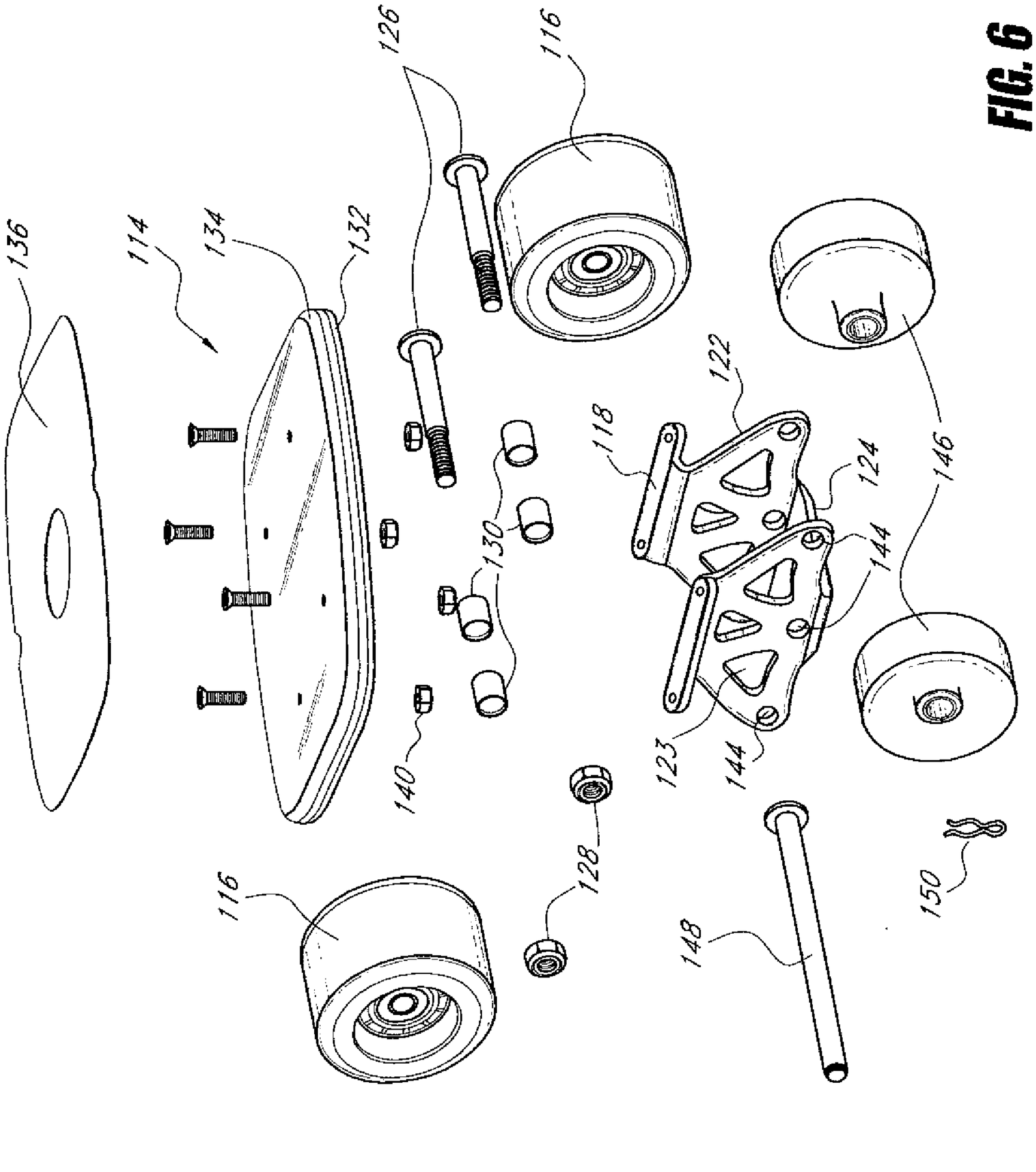
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FIG. 6

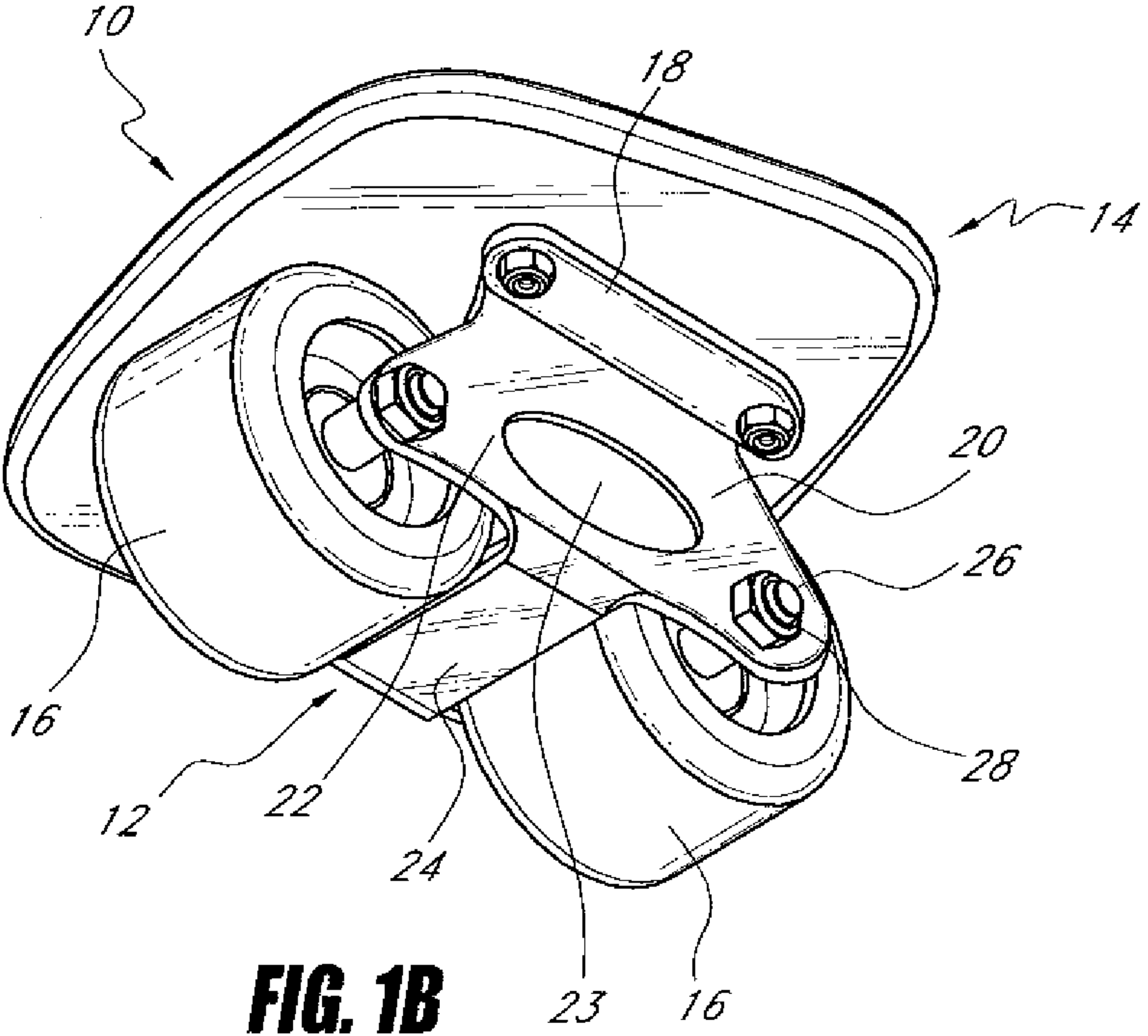

FIG. 1B