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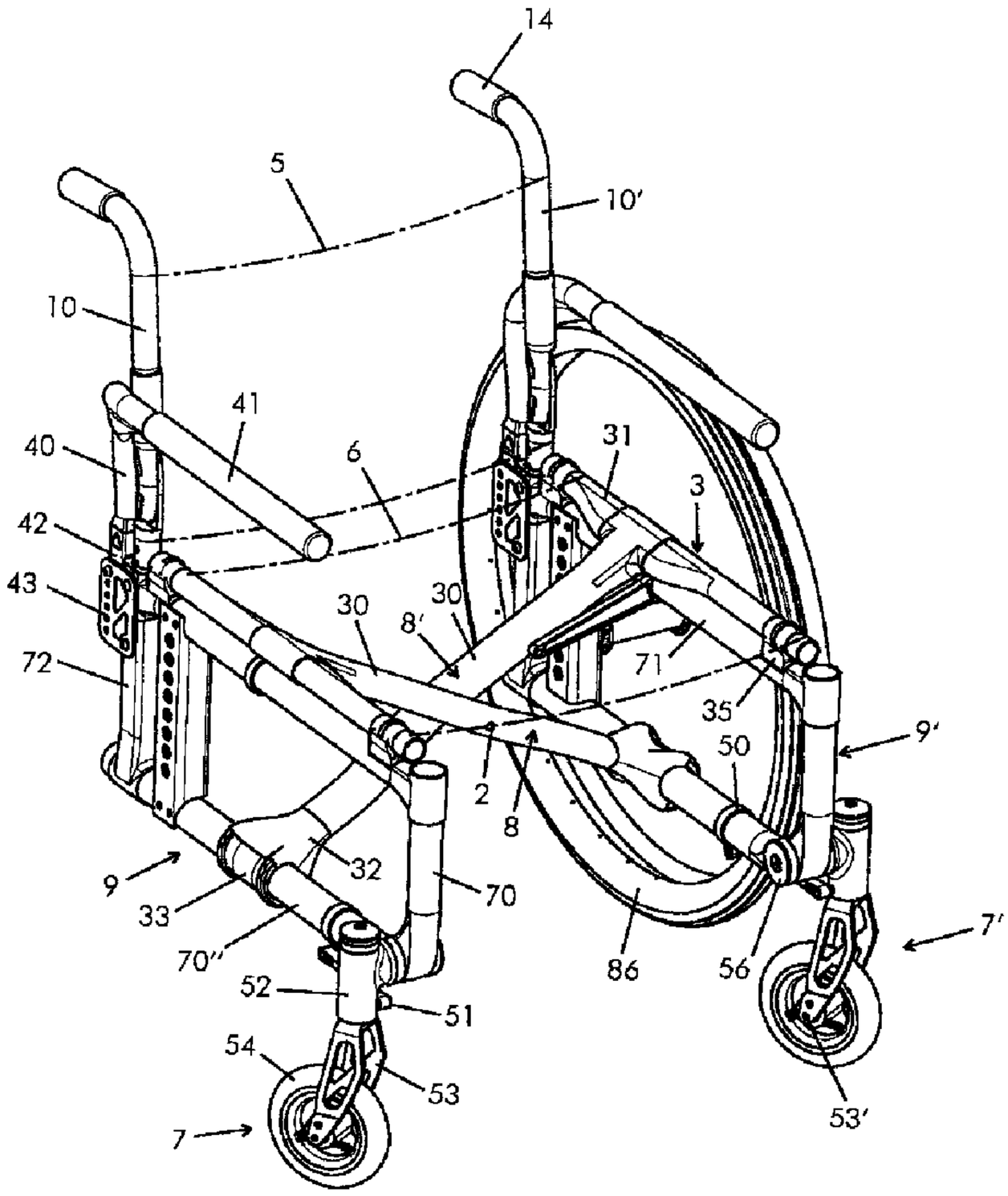
(54) **Titre : FAUTEUIL ROULANT LEGER PLIABLE ET PERSONNALISABLE**
(54) **Title: LIGHT WEIGHT FOLDABLE AND CUSTOMIZABLE WHEELCHAIR**



(57) **Abrégé/Abstract:**
A light weight foldable and customizable wheelchair is described. It is comprised of a tubular frame formed at least in part of molded polymer matrix composite material tubes and connectors. The wheelchair has two side frame tubular assemblies interconnected in

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(57) **Abrégé(suite)/Abstract(continued):**
side-by-side relationship by a pair of cross-brace members. The side frame tubular assemblies define a seating section therebetween. A rear wheel mounting bracket is secured to each of the side frame assemblies adjacent a rear end section thereof for securing a rear wheel to each of the side frame tubular assemblies at a desired selected position. A front wheel assembly is secured to a lowermost front end of each of the side frame tubular assemblies. The seating section is configurable along three axes. Each of the side frame tubular assemblies is adjustable in depth and in height, constituting a first and second of the three axes, by forming or cutting tubes of the side frame tubular assemblies to a desired length and gluing them to associated ones of the connectors. Each cross-brace member of the pair of cross-brace members, have a cross-brace connecting tube adjustable in length to provide a width adjustment which constitutes a third of the three axes of the side frame tubular assemblies. A pair of back canes is secured to the two side tubular assemblies and a seat and backrest support frame is secured respectively to the side frame tubular assemblies and the pair of back canes.

ABSTRACT

A light weight foldable and customizable wheelchair is described. It is comprised of a tubular frame formed at least in part of molded polymer matrix composite material tubes and connectors. The wheelchair has two side frame tubular assemblies interconnected in side-by-side relationship by a pair of cross-brace members. The side frame tubular assemblies define a seating section therebetween. A rear wheel mounting bracket is secured to each of the side frame assemblies adjacent a rear end section thereof for securing a rear wheel to each of the side frame tubular assemblies at a desired selected position. A front wheel assembly is secured to a lowermost front end of each of the side frame tubular assemblies. The seating section is configurable along three axes. Each of the side frame tubular assemblies is adjustable in depth and in height, constituting a first and second of the three axes, by forming or cutting tubes of the side frame tubular assemblies to a desired length and gluing them to associated ones of the connectors. Each cross-brace member of the pair of cross-brace members, have a cross-brace connecting tube adjustable in length to provide a width adjustment which constitutes a third of the three axes of the side frame tubular assemblies. A pair of back canes is secured to the two side tubular assemblies and a seat and backrest support frame is secured respectively to the side frame tubular assemblies and the pair of back canes.

LIGHT WEIGHT FOLDABLE AND CUSTOMIZABLE WHEELCHAIR

TECHNICAL FIELD

The present invention relates generally to wheel chairs, and more particularly to an ultra light wheelchair having a modular polymer matrix composite material frame that can be easily custom fitted for disabled persons of different sizes and statures. The modular frame provides a seating section which is configurable along three different axes whereby to provide for depth, height and width adjustment thereof.

BACKGROUND ART

It is known to construct wheelchairs with tubular members such as hollow metal tubes in an attempt to reduce weight of the structures while preserving strength. It is also known to provide lateral adjustment of the seating section of the wheelchair. The tubular frames of these wheelchairs are also provided with multiple connectors and bolts in their assemblies. Because these wheelchairs are often carelessly manipulated and transported, these connectors loosen and are damaged or lost and frequent maintenance is therefore required. The rigidity of these frames also transmits vibrations to the user person when the chair is displaced on a rough surface. These vibrations, over long term, cause discomfort and pain to the user.

SUMMARY OF THE INVENTION

It is a feature of the present invention to provide a wheelchair which substantially overcomes the above-mentioned disadvantages.

Another feature of the present invention is to provide a wheelchair wherein the frame thereof is constructed of molded modular composite polymer materials whereby to provide a wheelchair frame which is strong and ultra light weight.

Another feature of the present invention is to provide a light weight foldable and customizable wheelchair wherein the frame members are modular members constructed of polymer matrix composite hollow tubular members which can be cut to length and bonded together by glue whereby there are fewer bolts in the assembly which can become disconnected.

Another feature of the present invention is to provide a foldable and customizable wheelchair wherein the support frame can be configured along three different axis to provide adjustment of the seating section in height, depth and width.

Another feature of the present invention is to provide a light weight foldable and customizable wheelchair having a tubular frame constructed of modular polymer matrix composite material and wherein some of the frame members are molded in a single adjustable mold and wherein connectors are integrally molded with the tubular members and differing from the conventional method of using lugs bonded to a tube.

Another feature of the present invention is to provide a light weight foldable and customizable wheelchair which can be constructed to fit intended users of different sizes and statures with minimal tooling and resources, within a short period of time and at reduced manufacturing costs.

Another feature of the present invention is to provide a light weight foldable and customizable wheelchair wherein there is provided a cross bracing structure which is light

weight and novel in construction to provide easy connection and disconnection to side frames.

Another feature of the present invention is to provide a light weight foldable and customizable wheelchair wherein the front wheels are precisely adjustable in angle and height and very safe in construction, can withstand impact and which can absorb shocks.

Another feature of the present invention is to provide a light weight foldable and customizable wheelchair wherein the rear wheels thereof are greatly adjustable, stiffer, less bulky and aesthetically pleasing to the eye.

Another feature of the present invention is to provide a light weight foldable and customizable wheelchair wherein the rear wheels are adjustably inclinable.

According to the above features, from a broad aspect, the present invention provides a light weight foldable and customizable wheelchair comprising a tubular frame formed at least in part of molded polymer matrix composite material tubes and connectors, said wheelchair having two side frame tubular assemblies interconnected in side-by-side relationship by a pair of cross-brace members, said side frame tubular assemblies defining a seating section therebetween, a rear wheel mounting post assembly secured to each said side frame assemblies adjacent a rear end section thereof for securing a rear wheel to each said side frame tubular assemblies at a desired selected position, said rear wheel mounting post assembly having an adjustable mounting post with a plurality of axle receiving holes disposed along an axle support axis extending vertically through said mounting post, and a clamp at opposed ends of said adjustable mounting post for engagement with opposed horizontal tubular members of said side frame tubular assemblies, said opposed horizontal tubular members having rib formations to provide immovable retention of said clamps, said clamp at opposed ends of said mounting post providing horizontal displacement and securement of said mounting post to a

desired position in said side frame tubular assemblies, a front wheel assembly secured to a lowermost front end of each said side frame tubular assemblies, said seating section being configurable along three axes; each said side frame tubular assemblies being adjustable in depth and in height, constituting a first and second of said three axes, by forming or cutting tubes of said side frame tubular assemblies to a desired length and gluing same to associated ones of said connections; each cross-brace member of said pair of cross-brace members having a cross-brace connecting tube adjustable in length to provide a width adjustment constituting a third of said three axes, of said side frame tubular assemblies; a pair of back canes secured to said two side frame tubular assemblies and a seat and backrest support secured respectively to said side frame tubular assemblies and said pair of back canes.

BRIEF DESCRIPTION OF THE DRAWINGS

A preferred embodiment of the present invention will now be described with reference to the accompanying drawings in which:

Fig. 1 is a perspective view of a wheelchair constructed in accordance with the present invention;

Fig. 2 is a perspective view showing the folding mechanism of the wheelchair;

Fig. 3 is a perspective view of the side frame;

Fig. 4 is a perspective view of the cross-brace;

Fig. 5 is a perspective view front fork and hardware;

Fig. 6 is a perspective view of the adjustable height arms;

Fig. 7 is a perspective view of the rear wheel mounting bracket;

Fig. 8 is a perspective view of the back canes;

Fig. 9 is a side view of the folding mechanism;

Fig. 10 is a side view illustrating the shape of the lower curve flange connector of the canes; and

Fig. 11 is a side view illustrating the shape of the cane support insert with its curve connecting end formation.

DESCRIPTION OF PREFERRED EMBODIMENTS

Referring to the drawings, Figure 1 illustrates the construction of the light weight foldable and customizable wheelchair of the present invention. The wheelchair comprises a tubular frame formed at least in a major part of molded polymer matrix composite material tubes and connectors as will be described later. The wheelchair has two side frame tubular assemblies 9 and 9′ of identical construction and one of which will described herein in detail. The wheelchair is one that is manually displaceable by the use of handles 14. The wheelchair is also a foldable wheelchair with the two side frame tubular assemblies interconnected in side-by-side relationship by a pair of cross-brace members 8 and 8′. All of the tubular members are fabricated from polymer matrix composite material.

The two side frame tubular assemblies are provided with rear wheels 86, only one of which is herein illustrated, with each wheel being mounted to a mounting bracket 80 secured to each of the side frame assemblies and adjacent a rear end section thereof. The wheels are secured at a selected position to these mounting brackets 80 as will be

described later. A front wheel assembly 7 and 7′ is secured to each of the side frame tubular assemblies at a front lower end thereof. Although not illustrated in Figure 1, a plurality of accessories are secured to the tubular frame and these do not form part of the present invention. For example, a seating section is defined over the pair of side frame tubular assemblies 9 and 9′ as schematically illustrated at 6 and a back rest support of canvas or padded fabric is interconnected between the canes 10 and 10′ to form a backrest for a user person.

The seating section 6 is configurable along three axes whereby to adjust the width, the depth and the height of the seating section.

With reference to Figures 2 to 4 there will be described the construction of the side frame tubular assemblies 9 as well as the cross-brace members 8. With reference specifically to Figure 3 it can be shown that the side frame tubular assembly 9 is a rectangular tubular side frame assembly comprised of a first straight upper tubular member 71 molded to a desired length and having transverse connectors 71′ and 71′′ integrally molded therewith. They are formed in a mold which is a modular adjustable mold whereby the tubular member 71 can be made of different lengths. A second molded tubular member 70 is molded as a unitary part and it has a front vertical tubular arm 70′ and a transverse horizontal tubular arm 70′′. The arms 70′ and 70′′ are interconnected together through a molded head tube sleeve 73 integrally formed therewith. The front vertical tubular arm 70′ and the horizontal tubular arm 70′′ have free ends which are free of any connecting part whereby the arm 70′ and 70′′ can be cut to a desired length to adjust the height and depth of the seating section 6.

The rectangular tubular side frame 9 is further provided with a third molded rear vertical tubular arm 72 which is provided with a transverse connector 72′ at a lower end. The opposite end of the third molded rear vertical tubular arm 72 is a free upper end and it is also cut to a desired length. The free ends of the arms 70′, 70′′ and 72′ are received in associated ones of the connectors 71′, 71′′ and 72′ and glued therein by a suitable glue. Again all of these arms and connectors are molded from a polymer matrix composite material.

With reference now to Figures 2 and 4, the construction of the cross-brace connecting tubes 30 and 30′ will now be described. Each cross-brace connecting tube 30 and 30′ is provided with a connecting clamp 4 at a lower end thereof for pivotal connection to the horizontal tubular arm 70′′ of the second molded tubular member 70 of one of the rectangular tubular side frames, as shown in Figure 1. A clamping member 3, in the form of a seat cross-brace tube 31, is provided at an upper end of the cross-brace tube 30 for removable connection with the first straight upper tubular member 71 of the other of the rectangular tubular side frame, namely side frame 9′ as shown in Figure 1. A link rod 34 is pivotally connected at one end to the first straight upper tubular member 71 of the rectangular tubular side frame 9′ and at an opposed end to the cross-brace connecting tube 30. The cross-brace connecting tubes 30 and 30′ are interconnected together on a pivot connection tube at mid-length thereof whereby to cause the rectangular tubular side frames to be folded one adjacent the other. The cross brace connecting tube 30 and its end connecting sleeve 30′ are molded from the polymer matrix composite material. The length of the cross-brace connecting tube 30

is adjusted by cutting its free end portion 30''. After the cross-braces have been cut to length then a hole 30''' is drilled centrally of the cross-braces whereby they are pivotally interconnected together by a pivot pin (not shown) at the center thereof.

The cross-brace tubular assemblies 8 and 8' provide a folding mechanism as well as a strong inter-connecting mechanism between the side frame tubular assemblies 9 and 9'. The connecting clamp 4 connects the lower end of the cross-braces to the tubular arm 70'' substantially centrally thereof as shown in Figure 1. The connecting clamp 4 is a metal clamp having a clamp jaw 32 secured to the free end of the cross-brace 30 for receiving a portion of the tubular arm 70' in close fit therein. The clamp jaw 32 is held in position by a guide sleeve 38 which is glued onto the horizontal tubular arm 70' substantially centrally thereof. A cross-brace clamp flange 33 is connected to the jaw 32 by clamping bolts 37. The connecting clamp 40 is dimensioned whereby to be pivotally connected about the tubular arm 70''. The opposed end of the cross-brace arm 30 is adapted to receive a seat cross-brace tube 31 in its connecting sleeve 30' and immovably secured therein by glue. This seat cross-brace tube is also constructed of light weight polymer matrix composite material. The free ends of the cross-brace tube 31 is fitted with H-block guide sleeves 36 which are glued therein. These guide sleeves 36 are configured whereby to be received in H-block connectors 35 which are better illustrated in Figure 2 and which are immovably secured by glue or other means to the straight upper tubular member 71 of each rectangular tubular side frame 9 and 9', as better seen in Figure 1. Accordingly, the top end of the cross-brace tubes 30 and 30' are connected to the

rectangular tubular side frames by releasable clamping engagement with the H-block guide sleeve 36 into the H-blocks 35 in a sort of snug fit engagement. The link rod 34 is provided with each of the cross-braces to maintain a connection to the side frames 9 and 9' and by disengaging the cross-brace tubes 31 with a lifting motion, they disconnect from the H-blocks and permit the side frames to be folded one adjacent the other. The sleeves 36 are provided with a circumferential ridge 36' that engage snugly in channels provided in the H-blocks 35 and this prevents translationary displacement of the cross-brace tubes 31 with the side frames thereby providing for a rigid interconnected frame.

Referring now to Figure 7 there is shown the rear wheel mounting bracket 80 and its construction. The bracket 80 is fabricated from polymer matrix composite tubular material and herein of substantially rectangular cross section. It comprises an outer straight tube 85 reinforced by and inner straight tube 84 also of rectangular cross section. The inner tube 84 is glued within the outer tube 85. The tube 85 defines opposed flat side walls 85''. A plurality of axle receiving holes 83 are disposed along a straight vertical axis of the opposed flat side walls 85' with the holes 83 of each side wall 85' being aligned with one another whereby to receive an axle in support engagement therewith.

The rear wheel brace mounting bracket 80 is further provided with securing brackets 81 and 82 integrally formed at opposed ends thereof. The upper securing bracket and lower securing bracket are machined in the outer ends of the tubular members. These brackets 81 and 82 provide for securement of the mounting bracket between the first

straight upper tubular member 71 and the horizontal tubular arm 70′ of each rectangular tubular side frame 9 and 9′. The brackets 81 and 82 also permit for the positioning of the bracket 80 at any desired location in the rear portion of the rectangular tubular side frames 9 and 9′ to customize it to the intended user. As herein shown the upper securing bracket 82 is of substantially U-shaped configuration and is provided with holes 82′ to receive fasteners therein. The lower securing bracket 81 is formed as a single outer flange and is also provided with holes 81′ to receive fasteners for securing same to the rectangular tubular side frame.

In order to provide a camber of the rear wheels 86 there is provided a camber washer 86′ that may be secured inside the flange wall of the lower securing bracket 81 whereby to tilt the wheel mounting brace 80 outward at its lower end whereby the wheel will be slanted outwardly in its lower portion.

Referring now to Figure 5 there is shown the construction of the front wheels 7 and 7′. As herein shown the head tube 52, to which the caster bracket 53 is adjustably secured, is provided with a connecting tube 52′ which is received in the hollow tubular connector 73 of the second molded tubular member 70. The tubular connector 52′ has an inward thread and it is held in position within the connector 73 by a threaded cap 56 which is threaded into the tubular connector tube 52′ from the opposed side of the hollow connector 73. The head tube 52 is provided with two roller bearings (not shown) whereby to permit free rotation of the fork 53. The fork 53 is provided with two or more holes 53′ whereby to permit vertical adjustment of the caster 54. For further adjustments there is provided a series of spacer rings 57 of variable thicknesses that can

be placed at the top or at the bottom of the head tube 52. A guide rod 51 is provided whereby to adjust the perpendicular position of the stem 60 or the axis of rotation of the fork 53. The rod 51 accordingly adjusts the angle of the head tube 52. The fork rod 51 is secured to the horizontal tubular member 70'' by a clamp 50 which is secured to the free end 51' of the fork rod 51. The other end 51'' is secured to a connecting pin 52'' formed integral with the head tube 52. The head tube 52 is an aluminum tube. The clamp 50, the rod 51 and the head tube 52 form a triangular system which permits precise adjustment of the axis of rotation of the fork 53. The adjustment is provided by sliding the clamp 50 and securing the clamp when the head tube is at a desired angle.

With reference now to Figures 1 and 6 there will be described the construction of the L-shaped armrest 40 which is also molded from polymer matrix composite material. The armrest is made from independent parts which are glued together and attached to the hollow arm connector 42. The connector 42 is of substantially rectangular cross section and is provided with a beveled lower free end 42'. A connecting angulated slot 44 is provided in opposed side walls 42'' of the hollow connector 42 and transversely aligned with one another. The hollow arm connector 42 is secured between a pivot bracket 43 formed by a pair of mounting plates 43a and 43b. These mounting plates are secured on a respective one of opposed sides of the rear one of the transverse connectors, herein connector 71'' which is also rectangular cross section.

As shown in Figure 6 the mounting plates 43a and 43b are provided with a series of connecting holes 43' transversely aligned with respect to the mounting plates and

provided along a rear edge portion of these plates which project beyond the connector 71'' when secured in position, as better illustrated in Figure 1. The hollow arm connector 42 is secured between selected ones of these holes 43' by a connector pin 43'' whereby the elevation of the arm support rod 40' can be adjusted. The pin 43'' also provides for pivotal displacement of the arm 40.

The pivotal arm 40 is secured at a position of use by placing the hollow arm connector 42 vertically between the plates 43a and 43b wherein the connecting pin 43'' is at an upper end 44' of the angulated slot 44. To position the arm 40 at a retracted position it is necessary simply to pull the arm upwardly whereby the connector 42 moves up and rearwardly due to the angulation of the slot 44 until the pin reaches the lower end 44'' of the slot 44. The arm can then be angulated rearwardly in the direction of arrow 100 wherein the beveled lower free end 42' rests flush on a rear wall of the transverse connector 71''.

Referring now to Figures 1, 8, 10 and 11 there will be described the construction of the back canes 10 and 10'. The back canes are also molded from polymer matrix composite material with sections thereof being glued together. The back canes are also provided with a handle 14. As herein shown the back canes are angularly adjustable back canes which are comprised of a straight vertical tube section 10' provided with a lower curved flange connector formation 11. A cane support insert 12 is secured in an open top end of the transverse connector 71'' by a coupler 13 which is of square cross section to fit into the open end of the connector 71''. The top end of the coupler is provided with a circular cavity 13' to receive the connecting base 12' of the cane support insert 12. The cane support insert is

better illustrated in Figure 11 and it has a curved connecting end formation 12'' for facial arresting coupling with the curved flange 11, which is better illustrated in Figure 10 whereby to connect the cane at a desired rearwardly inclined angle. Fasteners (not shown) extend between the holes 12''' in the cane support insert 12 and selected ones of the hole formations 11' formed in the curved flange connector formation 11. Accordingly, the proper tilt angle of the canes 10 and 10' can be set with a slight elevation thereof resulting from the coupling between the flange connector formation and the cane support insert.

As better shown in Figure 11 the support insert 12 is also provided with an arcuate projection 101 which fits in an arcuate groove 102 of the curved flange connector formation 11 as shown in Figure 10. Accordingly, there is provided a rigid connection between these elements when secured together at a desired position by fastening bolts (not shown). The inclination of these canes also provides for the adjustment of the backrest 5 of the wheelchair.

One can therefore appreciate that the modular construction of the wheelchair as above described formed essentially of a light weight tubular members molded from polymer matrix composite material provides for a very rigid, light weight and shock absorbing frame making the wheelchair sturdy and easily transportable. The wheelchair can be folded together by an easy coupling disconnection of the cross arms permitting the folding of the side frames towards one another. Also, to reassemble the wheelchair in an operating position, it is merely necessary to place the seat cross-brace tubes 31 in clamping engagement with the H-block brackets 35 by pressing the brace tube 31 in snug fit engagement with these H-block brackets 35. Therefore there

is a quick connect and disconnect feature of the foldable wheelchair. The tubular construction and molded tubular parts also provide for ease of customizing a wheelchair to an intended user seeing that the seating section is configurable along three different axes. Accordingly, a wheelchair can be assembled very quickly to fit an intended user. The rear pivoting armrest also provides an added feature whereby to permit open access to the seating section of the wheelchair. The adjustability and support of the rear wheel is also one that is light weight and extremely solid while permitting adjustment of the wheels both in the vertical direction and also horizontally by adjusting the position of the wheel mounting brace with its associated rectangular side frame.

It is within the ambit of the present invention to cover any obvious modifications over the preferred embodiments described herein, provided such modifications fall within the scope of the appended claims.

WE CLAIM:

1. A light weight foldable and customizable wheelchair comprising a tubular frame formed at least in part of molded polymer matrix composite material tubes and connectors, said wheelchair having two side frame tubular assemblies interconnected in side-by-side relationship by a pair of cross-brace members, said side frame tubular assemblies defining a seating section therebetween, a rear wheel mounting post assembly secured to each said side frame assemblies adjacent a rear end section thereof for securing a rear wheel to each said side frame tubular assemblies at a desired selected position, said rear wheel mounting post assembly having an adjustable mounting post with a plurality of axle receiving holes disposed along an axle support axis extending vertically through said mounting post, and a clamp at opposed ends of said adjustable mounting post for engagement with opposed horizontal tubular members of said side frame tubular assemblies, said opposed horizontal tubular members having rib formations to provide immovable retention of said clamps, a front wheel assembly secured to a lowermost front end of each said side frame tubular assemblies, said seating section being configurable along three axes; each said side frame tubular assemblies being adjustable in depth and in height, constituting a first and second of said three axes, by forming or cutting tubes of said side frame tubular assemblies to a desired length and gluing same to associated ones of said connections; each cross-brace member of said pair of cross-brace members having a cross-brace connecting tube adjustable in length to provide a width adjustment constituting a third of said three axes, of said side frame tubular assemblies; a pair of

back canes secured to said two side frame tubular assemblies and a seat and backrest support secured respectively to said side frame tubular assemblies and said pair of back canes.

2. A light weight foldable and customizable wheelchair as claimed in claim 1 wherein each said side frame tubular assemblies are substantially rectangular tubular side frame assemblies each comprised of a first straight upper tubular member to cut to a first desired length to provide said depth adjustment; two transverse connectors each at opposed ends of the first straight upper tubular member; a molded tubular member having a front vertical tubular arm, and a transverse horizontal tubular connector interconnected together through a molded head tube sleeve integrally formed therewith, said front vertical tubular arm having a free end for cutting same to a second desired length to provide said height adjustment; a horizontal straight lower tubular member cut to the first desired length forming two free ends, one being connected to the transverse horizontal tubular connector; a third rear vertical tubular member cut to the second desired length forming two respective free ends; and a lower rear transverse connector at one end as the third rear vertical tubular member; said free end of the vertical tubular arm, another one of said two free ends of said horizontal straight lower tubular member and another one of the respective free ends of the third rear vertical tubular member each being received in associated ones of said transverse connectors for securement therein by glue to form said rectangular tubular side frame.

3. A light weight foldable and customizable wheelchair as claimed in claim 2 wherein said first straight upper tubular member, said horizontal straight lower tubular member and said third rear vertical tubular member are one of molded, rolled and extruded with said polymer matrix composite material, and wherein said two transverse connectors, said molded tubular member and straight lower rear transverse connector are molded of said polymer matrix composite material.

4. A light weight foldable and customizable wheelchair as claimed in claim 2 wherein said cross brace connecting tube is provided with a connecting clamp at a lower end for pivotal connection to said horizontal tubular member of said molded tubular member of one of said rectangular tubular side frame, and a clamping member at an opposite upper end for removable connection with said first straight upper tubular member of the other of said rectangular tubular side frame, and a link rod pivotally connected at one end to said first straight upper tubular member of the other of said rectangular tubular side frame and at an opposed end to said cross-brace connecting tube.

5. A light weight foldable and customizable wheelchair as claimed in claim 4 wherein said pair of cross-brace members are pivotally interconnected together on a pivot connection at about a mid-length thereof whereby to cause said rectangular tubular side frames to be folded one adjacent the other.

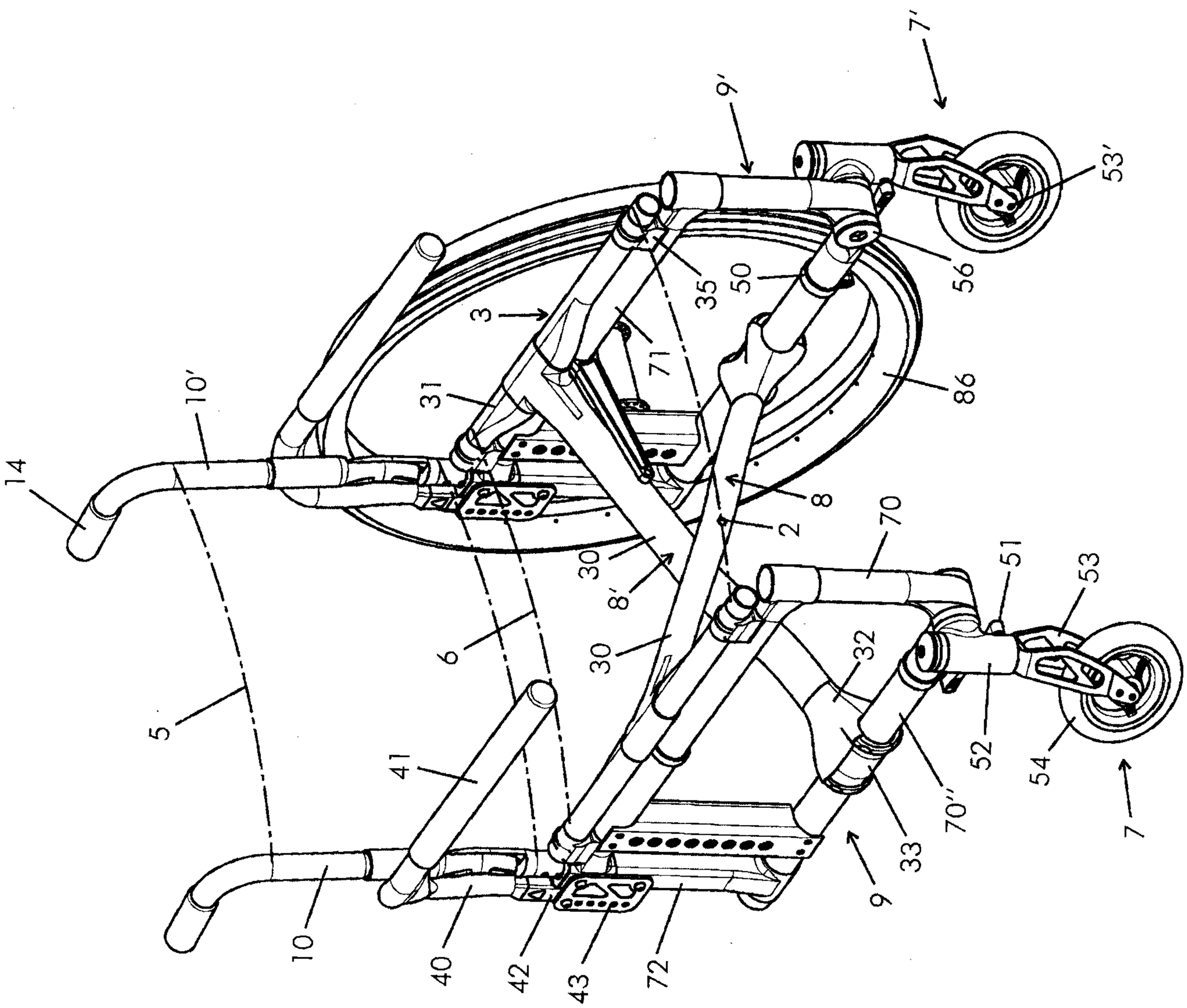
6. A light weight foldable and customizable wheelchair as claimed in claim 5, wherein said link rod is a flexible link rod to release tension in the backrest support when said rectangular tubular side frames are folded adjacent each other.

7. A light weight foldable and customizable wheelchair as claimed in claim 2 wherein said rear wheel mounting post assembly is formed by a machined rectangular tubular extrusion member, said tubular extrusion member having opposed flat side walls.

8. A light weight foldable and customizable wheelchair as claimed in claim 1, wherein the axle receiving holes are formed at an angle extending in a range of 0 to 12 degrees, from the horizontal for providing a camber to the rear wheel.

9. A light weight foldable and customizable wheelchair as claimed in claim 4 wherein universal clamps are connected to tubular members and said horizontal tubular member of said molded tubular member of said rectangular tubular side frame assembly at a desired position to provide interconnection with associated members of said wheelchair, the universal clamps each having two separate interconnectable clamp sections which engage together via a securing bolt and an integrally formed locking ridge in each said sections, the securing bolt providing securement of said clamp to said reinforced brace member with said locking ridge providing for interconnection of said parts together with said ridges interlocking with one another.

10. A light weight foldable and customizable wheelchair as claimed in claim 2 wherein said back canes are angularly adjustable back canes comprised of a straight vertical tube section having upper handle sections and a lower curved flange connector formation, a cane support insert secured in an open top end of a rear one of said transverse connectors, said cane support insert having a curved connecting end formation for facial arresting coupling with said curve flange connector formation to connect said cane at a desired rearwardly inclined angle.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9'
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50
35
3
71
31
10'
14
86
8
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53
30
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70''
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40
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43
72
7

Fig. 1

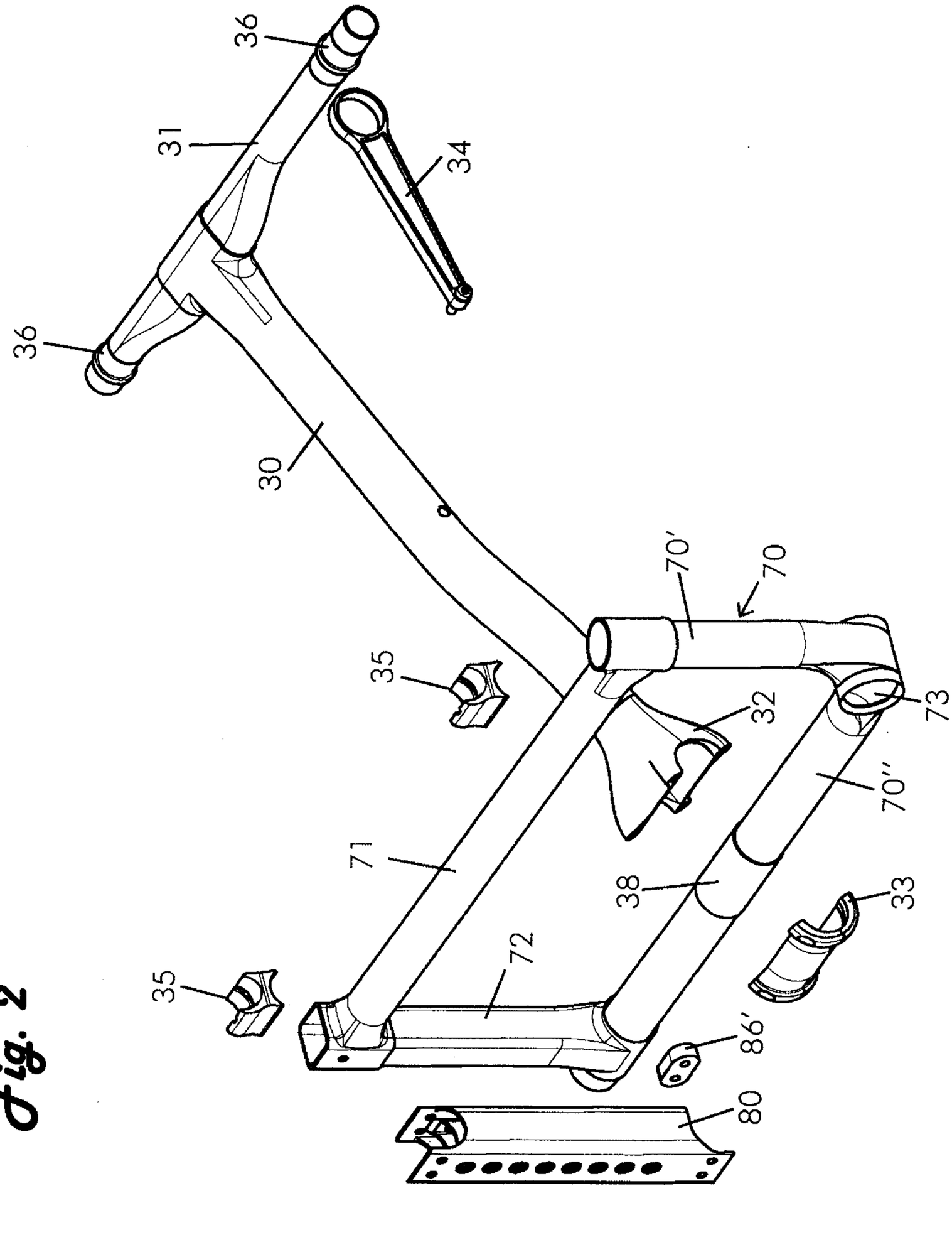


Fig. 2

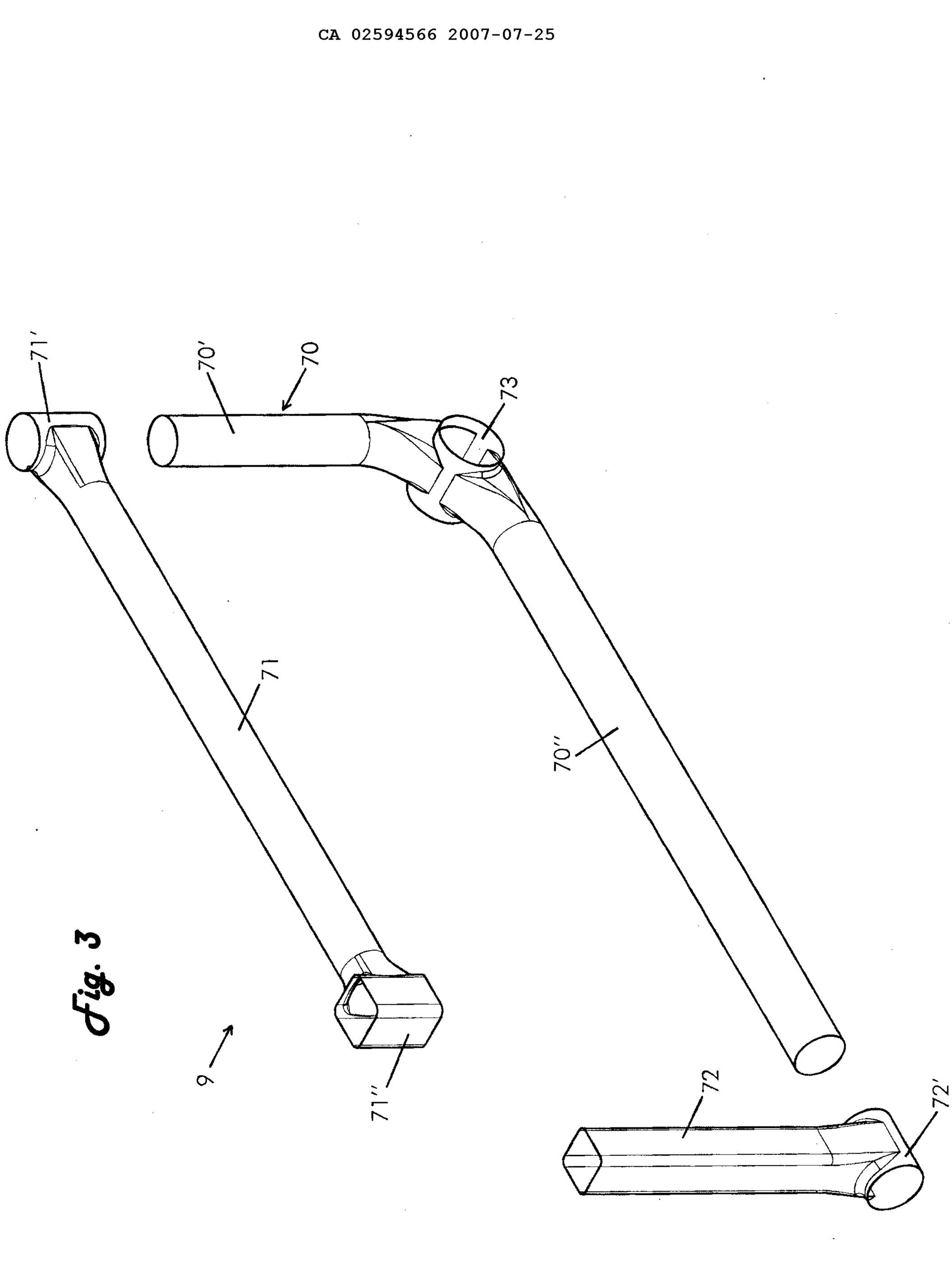


Fig. 3

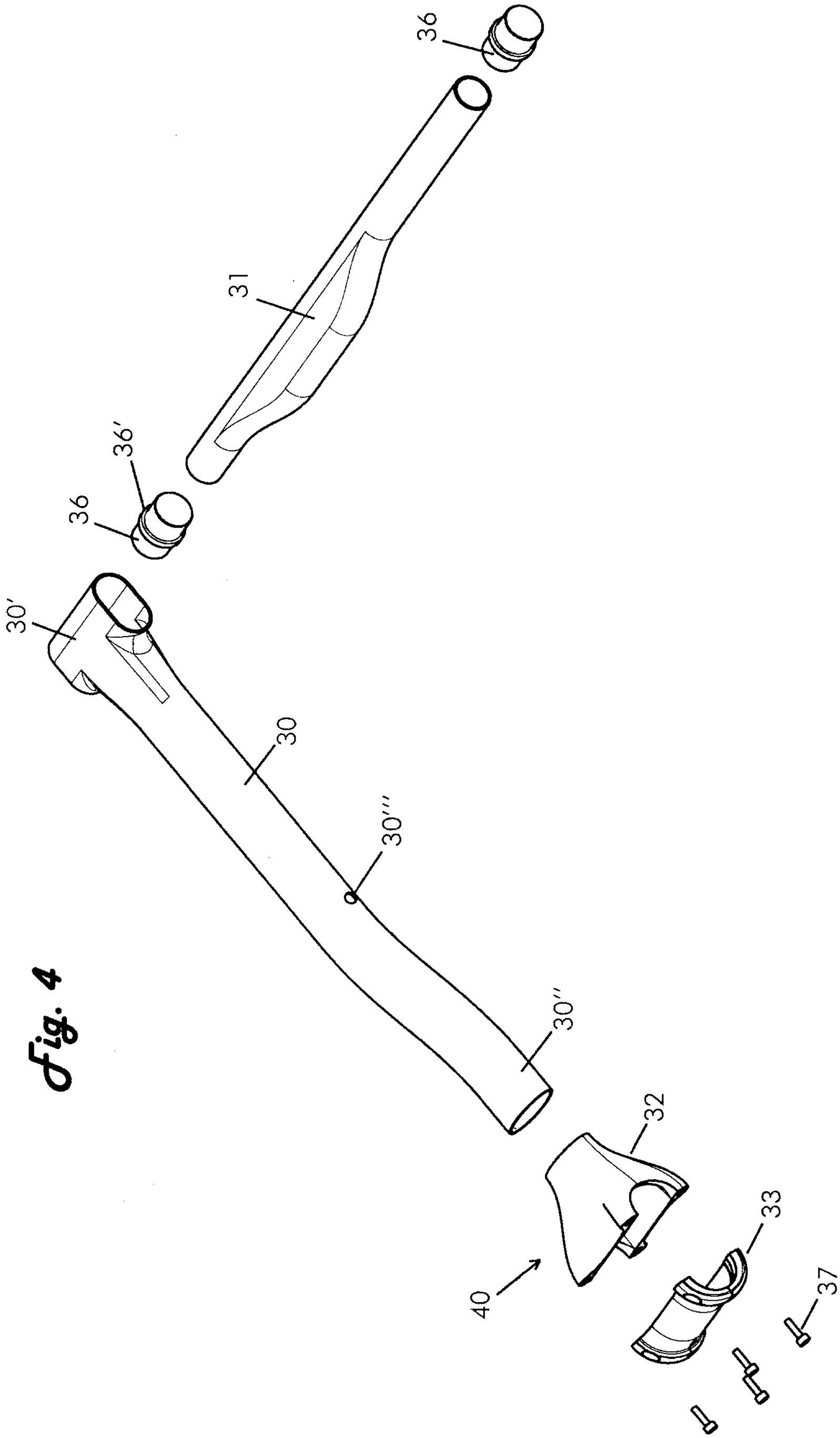


Fig. 4

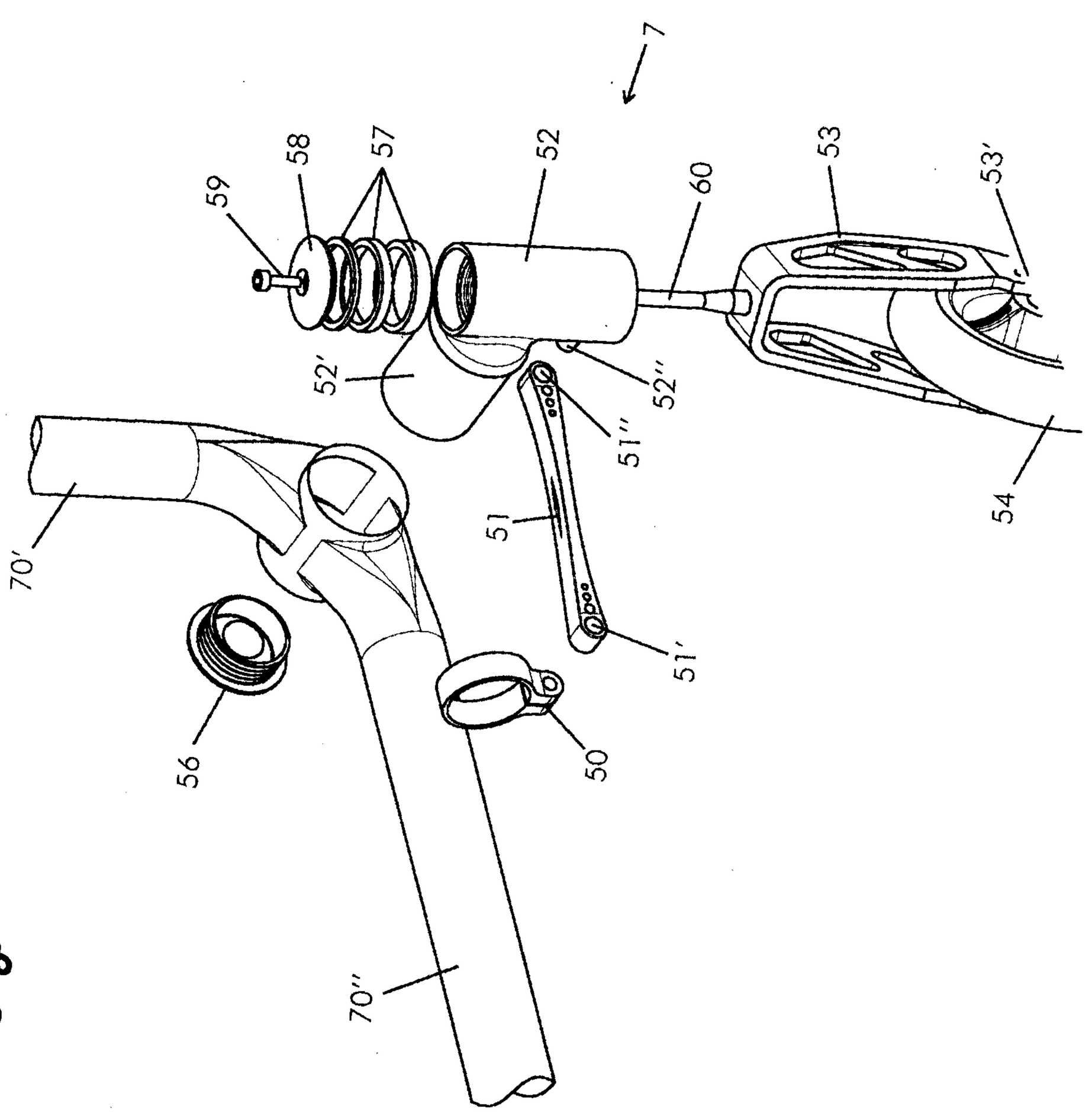
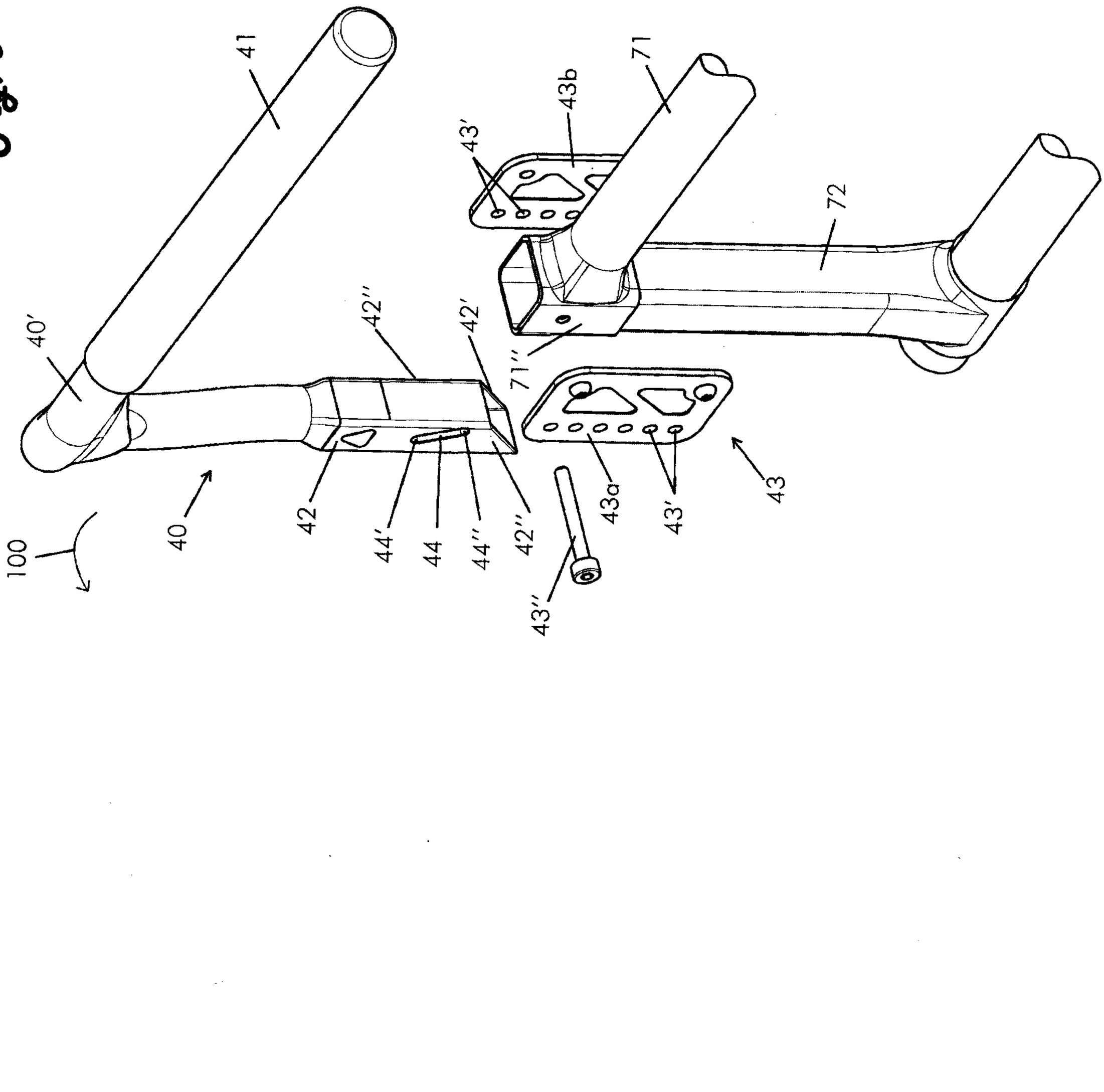


Fig. 5

Fig. 6



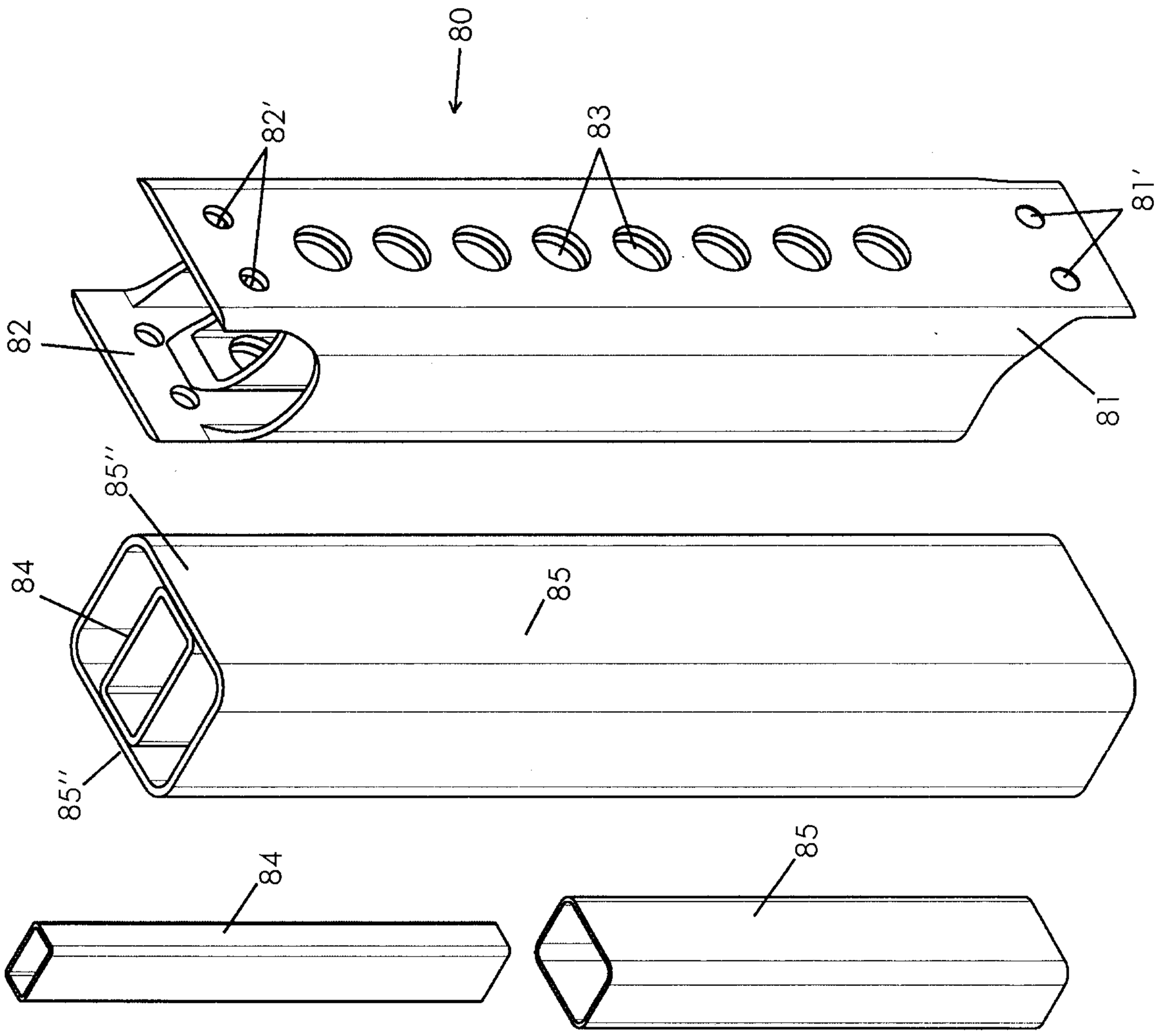
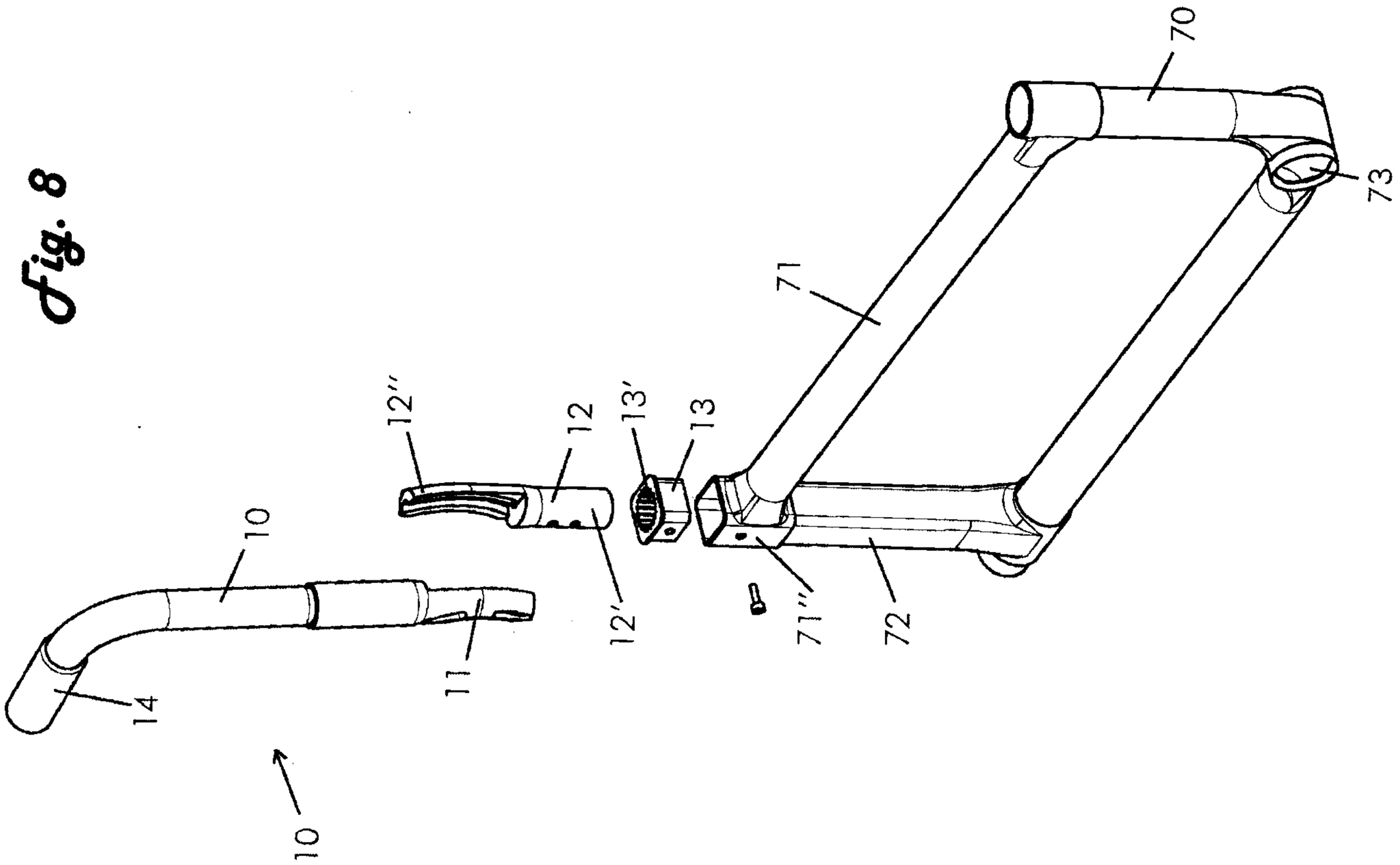


Fig. 7

Fig. 8



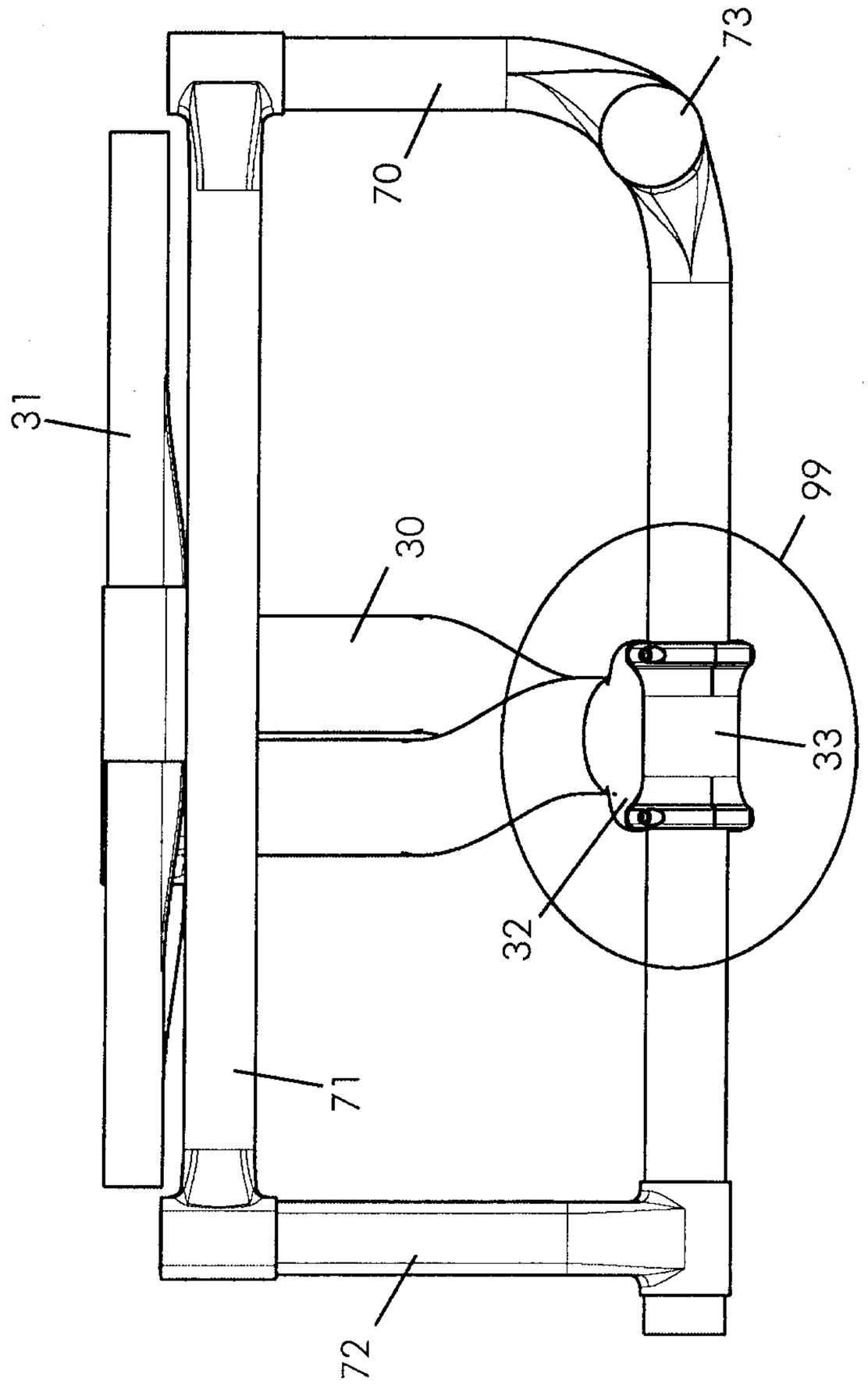


Fig. 9

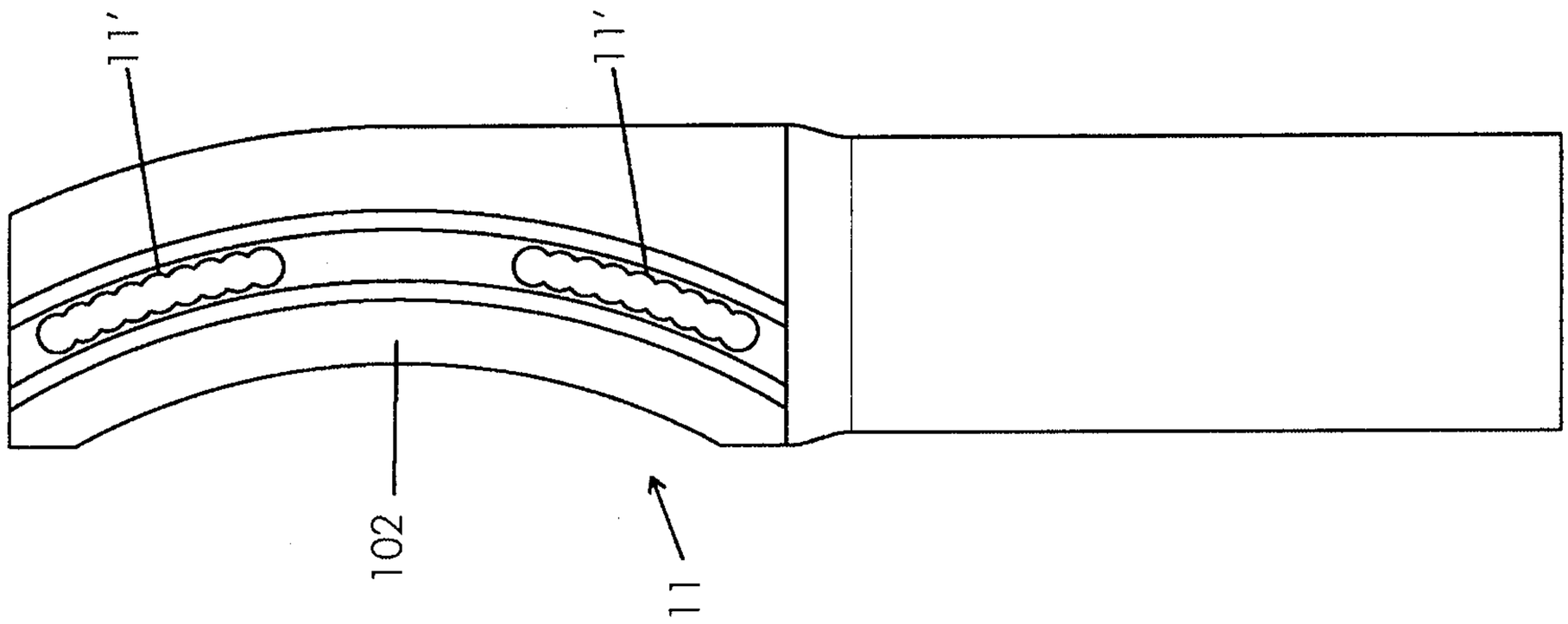


Fig. 10

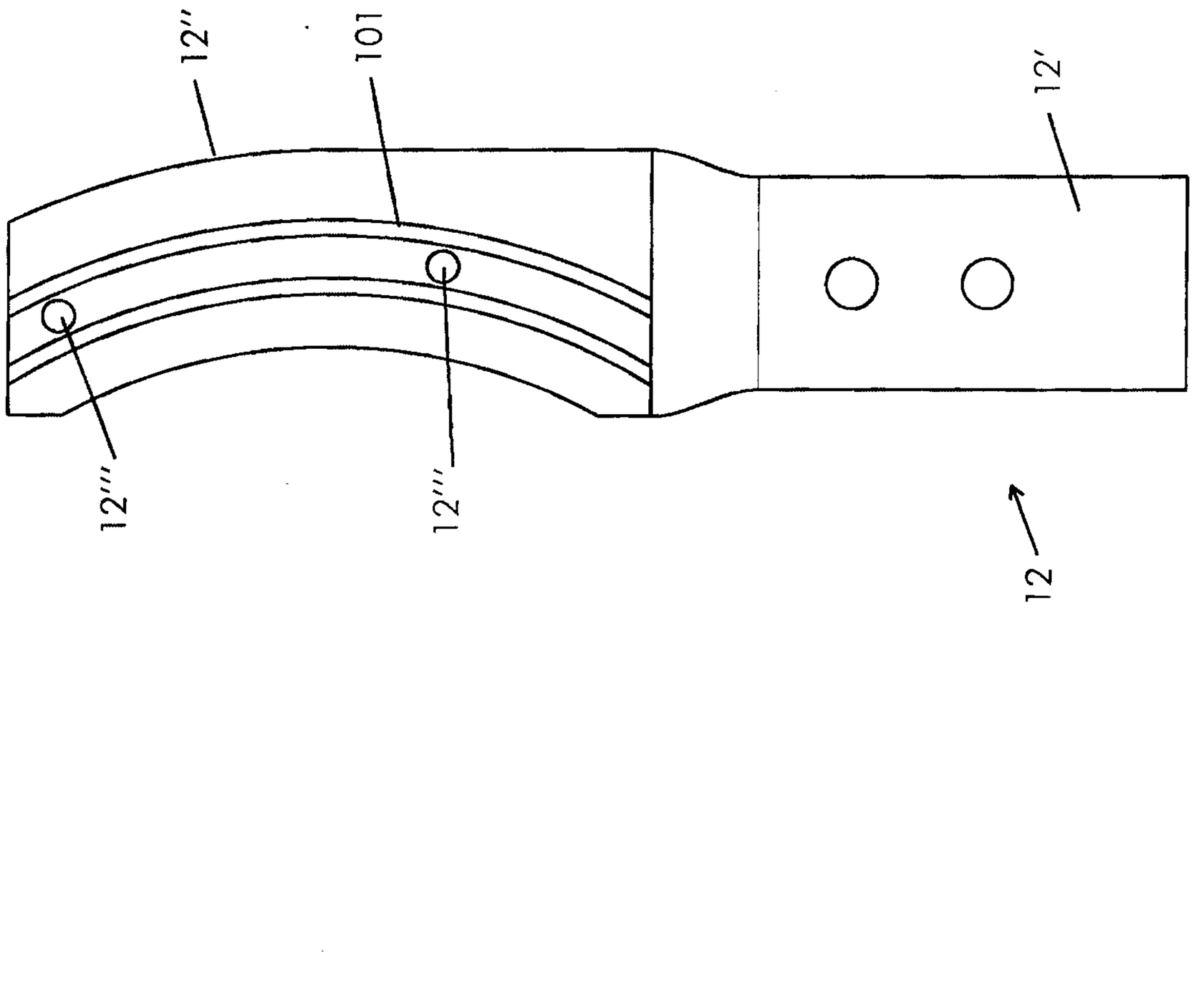
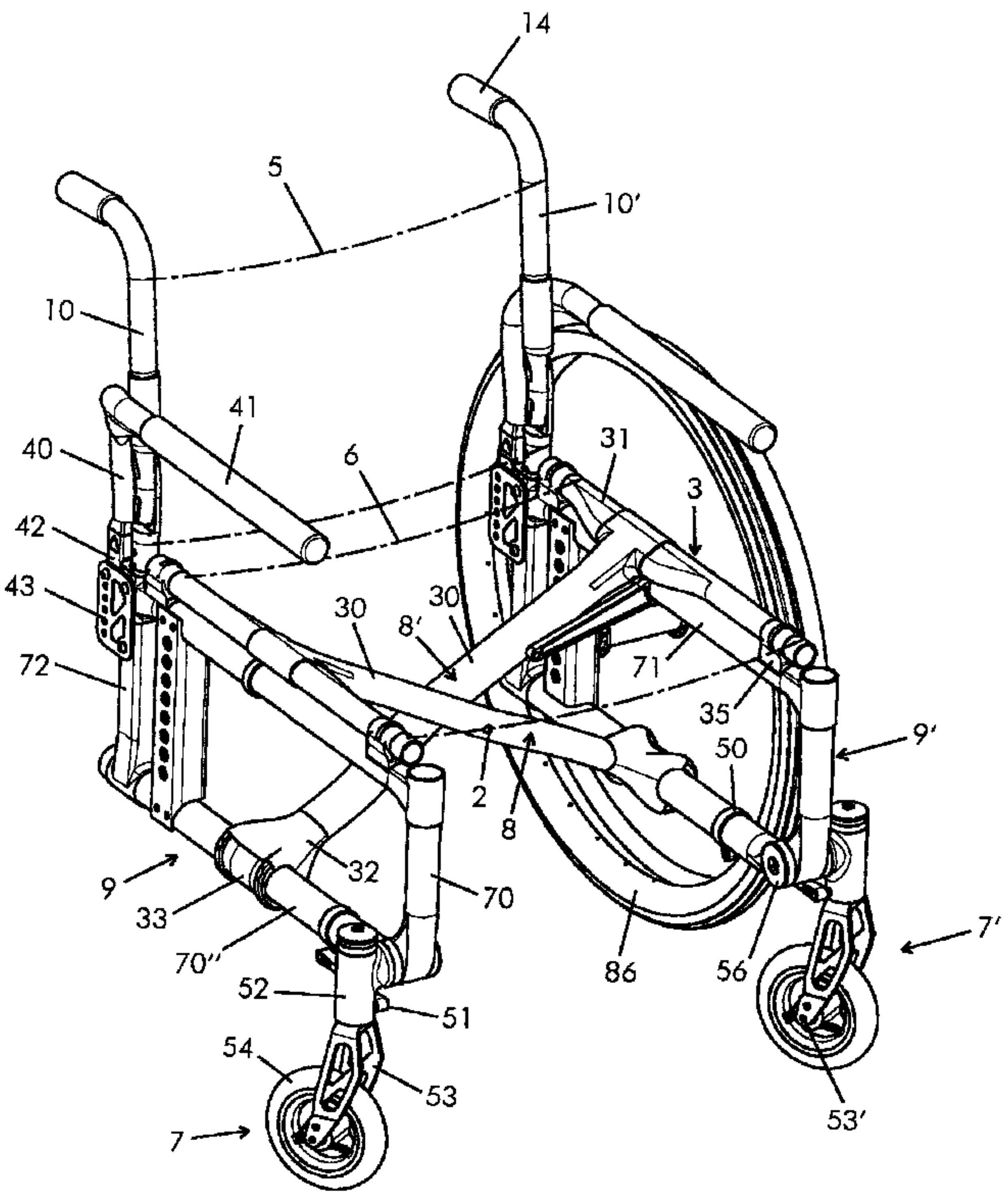


Fig. 11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