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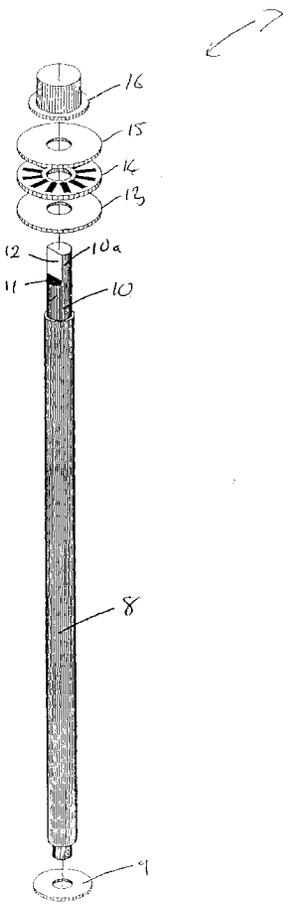
(54) Adjustable desk system

(57) An elongate support (3) for use in connection with a desk or desk system comprising two or more interconnected desks comprises a means (7) adapted to cuase longitudinal extension or contraction of the support (3). The means (7) comprises an outer tube (8) of a first diameter having an internal screw thread and an inner tube (10) having a complementary external thread. Each means (7) is provided with a drive boss (16) which is received by a sprocket driven by a drive belt or chain to cause rotation of one of the threaded tubes of the means (7) with respect to the other threaded tube to raise or lower the work surface of the desk or desk assembly.

Fig 1



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Description

[0001] The present invention relates to a modular height adjustment system and in particular to a modular height adjustment system for use in connection with a desk or with a desk system comprising two or more interconnected desks.

[0002] Desks are used by a variety of people for a number of jobs and accordingly various heights of desks are required. Often, desks are bought to suit a particular person and the job that they do, which can be inconvenient and costly when people change jobs.

[0003] A particular object of the present invention is to provide a height adjustment system for use in a desk or desk system to allow the height to be adjusted to suit a variety of people and jobs. The modular height adjustment system can be used in conjunction with desks, tables and work benches for use in industrial and educational applications.

[0004] In the context of the present invention, "desk system" is to be construed as two or more interconnecting desks.

[0005] In a first aspect, the present invention provides a modular height adjustment system comprising one or more supports adapted to be longitudinally extended or contracted.

[0006] In a second aspect, the present invention provides one or more supports for use in connection with a desk or with a desk system (as herein above defined) in which each said support is adapted to be longitudinally extended or contracted.

[0007] The means to extend or contract each support (hereinafter referred to as the lifting apparatus) preferably comprises an outer tube of a first diameter having an internal screw thread and an inner tube of a second diameter having a complementary external screw thread. The first diameter is larger than the second diameter and the internal and external screw threads engage to allow the inner tube to be received within the outer tube.

[0008] Preferably the outer tube forms the bottom portion of the lifting apparatus and the inner tube forms the top portion of the lifting apparatus. The upper end of the inner tube is preferably shaped to receive a drive boss and may be provided with a shoulder to receive one or more washers below the drive boss. One of the washers preferably comprises a roller bearing.

[0009] The outer and/or inner tubes may be provided with stop means to prevent the inner tube from being removed from the outer tube.

[0010] In a third aspect, the present invention provides a desk assembly comprising a work-surface and one or more supports in which each said support is adapted to be longitudinally extended or contracted, whereby the work-surface is respectively raised or lowered relative to the supports.

[0011] Preferably the supports are as hereinabove defined with reference to the first and second aspects of the invention.

[0012] Preferably the desk assembly is provided with two supports, which may be spaced apart to form leg-ends for the desk. Each leg-end is preferably provided with a supporting foot extending substantially at right angles to the leg-end. The supporting foot may be provided with one or more protrusions to allow easier movement of the desk assembly. Preferably the support foot is made by extrusion, most preferably from aluminium.

[0013] Preferably the lower end of the outer tube of the lifting apparatus is secured to a solid base, for example the support foot, substantially at right angles thereto.

[0014] Preferably the lifting apparatus is contained within an outer casing which may suitably comprise a lower portion of a first diameter telescopically received within an upper portion of a second diameter.

[0015] Preferably the casing is made by extrusion, most preferably from aluminium.

[0016] The lower portion of the casing is preferably secured to the support foot.

[0017] The top surface of the upper portion is preferably provided with an aperture through which the upper end of the inner tube of the lifting apparatus can pass before the washers and drive boss are secured thereto.

[0018] On rotating the drive boss the inner tube of the lifting apparatus can be screwed into or out of the outer tube to decrease or increase the height of the lifting apparatus. The outer casing is engaged by, and therefore contracts or extends, with the lifting apparatus by means of the telescopic engagement of the upper and lower portions.

[0019] Preferably, two members are provided to support the work-surface, one member being secured to the upper portion of each outer casing. Each support member preferably comprises a bracket, which may have secured thereto a rail shaped to receive the work-surface and hold it in place. Each bracket may be adjustable relative to the casing to allow the angle of the work-surface to be altered.

[0020] The work-surface is preferably a desk or tabletop. Alternatively, it may be a drawing board or a computer station.

[0021] As the outer casing contracts or extends with the lifting apparatus the work-surface is respectively lowered or raised.

[0022] The lifting apparatus is provided with drive means. Preferably, a single drive means is operatively associated with all of the sets of lifting apparatus of the desk assembly.

[0023] Where there are two sets of lifting apparatus the drive means comprises a longitudinal drive body, preferably made by extrusion, e.g., from aluminium. A single gear housing is preferably secured to one end and a single gear housing or alternatively a twin gear housing is secured to the opposite end.

[0024] Suitably, a first and a second sprocket are located one at each end of the drive body, preferably in

the gear housings, each receiving the drive boss of one of the two sets of lifting apparatus.

[0025] Conveniently, each drive boss is received in a gear housing by way of an aperture provided in the base of the housing.

[0026] A further sprocket may be provided to act as a main drive sprocket and may be located in the twin gear housing. Such a main drive sprocket will have operatively associated therewith means to rotate the drive sprocket. Alternatively where there is not a main drive sprocket the first or second sprocket may be associated with means to rotate the said sprockets. The means may be a handle (e.g. a crank handle) or a motor received by the drive sprocket through a second aperture in the twin gear housing or by the first or second sprocket through a second aperture in the single gear housing.

[0027] A drive belt engages both (or all three) sprockets such that the drive sprocket or one of the first or second sprockets rotates the drive belt and therefore all remaining sprockets, which in turn rotate the drive bosses and consequently the inner threaded tube of the lifting apparatus, to adjust the height of the desk.

[0028] The desk system may be provided with a modesty board extending between the leg-ends. The modesty board is preferably made by extrusion, most preferably from aluminium.

[0029] The means provided to drive the lifting means of two or more desk assemblies may be joined together and operated by a single drive sprocket, or one of the first or second sprockets, and an associated handle or motor.

[0030] According to a fourth aspect, the present invention provides a kit comprising at least two sets of lifting apparatus, means to drive the lifting apparatus and optionally means to support a work-surface, the lifting apparatus, the means to drive the lifting apparatus and the means to support the work-surface all being as described in respect of the first aspect of the present invention.

[0031] The kit may further comprise outer casings to surround each lifting apparatus and comprising upper and lower portions telescopically engaging each other. A support foot may be provided for each set of lifting apparatus.

[0032] The work-surface, which may consist of a desk or a table-top, a drawing board or a computer station, may be provided as part of the kit.

[0033] The kit may include a modesty board.

[0034] The parts of the kit are preferably labelled and assembly instructions are preferably provided.

[0035] An embodiment of the present invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 illustrates a height adjustment system according to the present invention;

Figure 2 illustrates a desk system according to one embodiment of the present invention;

Figure 3 illustrates the drive means of the desk of Figure 2; and

Figure 4 shows the way in which four drive means of interconnecting desks can be operatively connected and driven by a common motor.

[0036] Figure 1 shows the lifting apparatus which comprises an outer tube 8. The outer tube 8 has an internal screw thread and receives an inner tube 10 having a complementary external screw thread.

[0037] The end 10a of inner tube 10 is provided with a shoulder 11 and cut away portion 12. A first washer 13, a roller bearing 14 and a second washer 15 rest on the shoulder 11. A drive boss 16 fits over the end 10a and when turned causes the inner tube 10 to be screwed into or unscrewed from the outer tube 9. A stop (not shown) is provided to prevent the inner tube 10 from being completely removed from the outer tube 9.

[0038] Figure 2 shows the desk assembly 1 of an embodiment of the present invention, having support feet 2 extending from, and substantially at right angles to, the lower portion 3a of outer casing 3, which lower portion 3a is telescopically received within upper portion 3b of the casing 3. The casing 3 is secured to feet 2 by means of screws such as M8 x 25 Hex Socket Screws which pass through the feet 2 and into receiving brackets inside the lower portion 3a of casing 3. The outer casing 3 and feet 2 are extruded aluminium profiles whose open ends have been capped by an injection moulding of a plastics material.

[0039] A modesty board 4, also of extruded aluminium, extends between and is secured to the upper portions 3b of the outer casings 3. The modesty board 4 is secured to the outer casings 3 by being secured by screws such as M6 x 30 CSK Hex Socket Screws to two moulded ends which are then received by corresponding recesses on the upper portion 3b of casing 3.

[0040] Support brackets 5 extend one from each upper portion 3b of casing 3 and slidingly receive rails 6 which are shaped to support a flat desk top (not shown). The support brackets are secured to the upper portion 3b of the casing 3 by screws such as M6 x 15 Hex Socket Screws.

[0041] Within the outer casing 3 is housed the lifting apparatus 7 shown in Figure 1, the outer tube 8 being secured to the foot 2 by means of a bolt (not shown) and washer 9.

[0042] The washers 13, 14 and 15 are placed over the end 10a of the inner tube 10, followed by the drive boss 16, once the end 10a has been passed through a hole (not shown) in the end 3c of the upper portion 3b of casing 3.

[0043] A drive body 17 (see Figure 3), having a single gear housing 18 and 19 secured to each end, extends between the ends 3c of the upper portion 3b of the outer

casings 3.

[0044] A first sprocket 20 is situated in the single gear housing 18 and a second sprocket 21 is situated in the single gear housing 19. A drive belt 23 engages both sprockets 20 and 21.

[0045] The gear housings have apertures aligned with sprockets 20 and 21 to allow the drive bosses 16 of the lifting apparatus 7 to engage the sprockets 20 and 21 and a further aperture aligned with sprocket 21 to allow a drive handle (not shown) or a motor 24 to engage sprocket 21.

[0046] In use the motor 24 (or handle, not shown) drives the drive belt 23 by means of the drive sprocket 21, which in turn drives the sprocket 20 and rotates the inner tubes 10 of the lifting apparatus 7 by means of the drive bosses 16, which are consequently screwed into or out of the outer tube 9 depending upon the direction of the rotation.

[0047] As the lifting apparatus 7 extends or contracts the casing 3 extends or contracts by means of telescopic engagement of the upper and lower portions. The support rails 6 and therefore the desk top are raised or lowered accordingly. When the motor 24 is stopped the position of the desk top is maintained.

[0048] Figure 4 shows the drive body 17 of figure 3 having a single gear housing 18 and 19 at each end to contain the sprockets 20 and 21 respectively.

[0049] The gear housings 18 and 19 have apertures in both faces. The apertures are to be aligned with the centres of the sprockets 20 and 21, the apertures in the lower faces receiving the drive bosses 16 of the lifting apparatus 7 and the apertures in the upper face receiving double sprocket adapters 25 to allow the sprockets (not shown) of further drive bodies, 26 and 27, to be operatively connected with the sprockets of drive body 17 and a further drive body 28 is adapted to be operatively connected to drive body 27. Each of the further drive bodies is made up of the same components as the first drive body 17 and each receives lifting apparatus as described in the relation to the earlier Figures. However, the lifting apparatus is shared between connected drive bodies, for example a common lifting apparatus will be used where drive bodies 26 and 17 connect, where drive bodies 27 and 17 connect and where drive bodies 27 and 28 connect.

[0050] The motor 24 or handle 29 can engage any of the sprockets contained within the drive body gear housings, for example sprocket 21 in gear housing 19, by means of the gear housing 30 of drive body 26 and the sprocket contained therein, together with the connector 25. Alternatively it can engage the sprocket in the gear housing 31 of drive body 26, where the handle 29 is located, as shown in Figure 4.

[0051] The drive bodies 17, 26, 27 and 28 form part of a desk system comprising the components of the desk assembly of Figure 2, although only the drive bodies and connection means are shown in Figure 4.

Claims

1. An elongate support for use in connection with a desk (1) or with a desk system comprising two or more interconnected desks, **characterised in that** said support (3) is provided with means (7) adapted to cause longitudinal extension or contraction of said support (3).

2. A support as claimed in Claim 1, **characterised in that** the means (7) comprises an outer tube (8) of a first diameter and having an internal screw thread and an inner tube (10) of a second diameter and having a complementary external screw thread, and the internal and external screw threads engage to allow the inner tube (10) to be received within the outer tube (8).

3. A support as claimed in Claim 2, **characterised in that** one end (10a) of the inner tube (10) is shaped to receive a drive boss (16).

4. A support as claimed in Claim 3, **characterised in that** the end (10a) of the inner tube (10) is provided with a shoulder (11) to receive one or more washers (13, 14, 15) below the drive boss (16).

5. A support as claimed in Claim 4, **characterised in that** one of the washers (13, 14, 15) comprises a roller bearing (14).

6. A desk assembly, **characterised by** a work-surface operatively associated with one or more supports according to any one of Claims 1 to 5, whereby the work-surface is adapted to be respectively raised or lowered relative to the supports.

7. A desk assembly as claimed in Claim 6, **characterised in that** each means (7) is contained within an outer casing (3) comprising a lower portion (3a) of a first diameter telescopically received within an upper portion (3b) of a second diameter.

8. A desk assembly as claimed in Claim 7, **characterised in that** the lower portion (3a) of the outer casing (3) is secured to a base member (2) which extends substantially at right angles to the portion (3a).

9. A desk assembly as claimed in any one of Claims 6 to 8, **characterised in that** the means (7) is provided with drive means, for example, a single drive means operatively associated with all of the means (7) of the desk assembly.

10. A desk assembly as claimed in Claim 9, **characterised in that** it includes two sets of means (7) and the drive means is contained within an elongate

drive housing (17) having a first gear housing (18) secured to one end and a second gear housing (19) secured to the opposite end, each gear housing containing a sprocket (20, 21) and each sprocket being operatively associated with the drive boss (16) of a means (7), each drive boss (16) being received in a gear housing (18, 19) by way of an aperture provided in the base of the housing (18, 19).

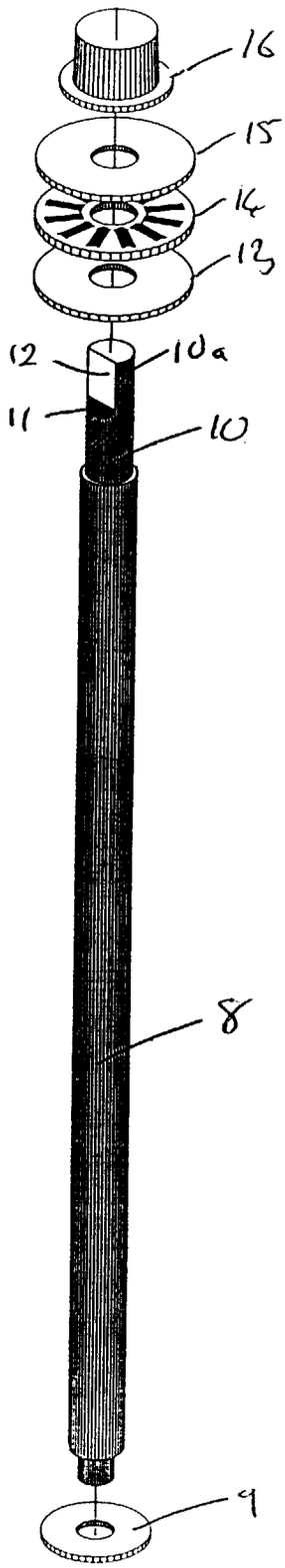
11. A desk assembly as claimed in Claim 10, **characterised in that** one of the sprockets (20, 21) is operatively associated with means to rotate the said sprocket, for example, a handle or a motor (24) received by the sprocket (20, 21) through an aperture in the gear housing (18, 19).

12. A desk assembly as claimed in Claim 10 or 11, **characterised in that** a drive belt or chain (23) engages the sprockets (20, 21), thereby rotating each drive boss (16) and consequently each inner threaded tube (10) to adjust the height of the desk.

13. A desk system comprising two or more desk assemblies as claimed in any one of Claims 6 to 12, **characterised in that** the drive means of said two or more desk assemblies are operated by a common drive sprocket.

14. A kit **characterised by** (i) at least two sets of extension and contraction means as claimed in any one of Claims 1 to 5 and (ii) drive means as claimed in any one of Claims 9 to 12.

Fig 1



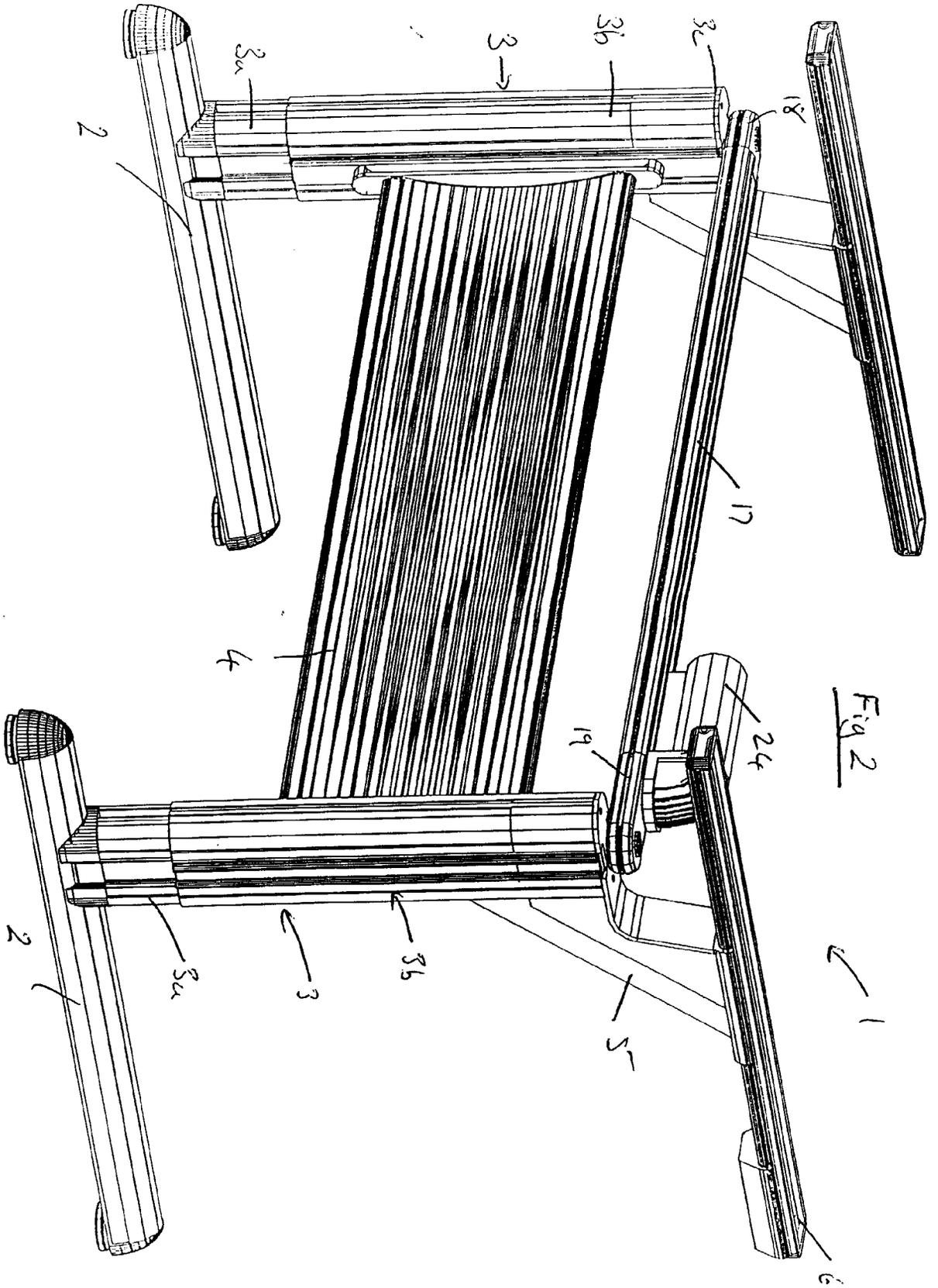


Fig 2

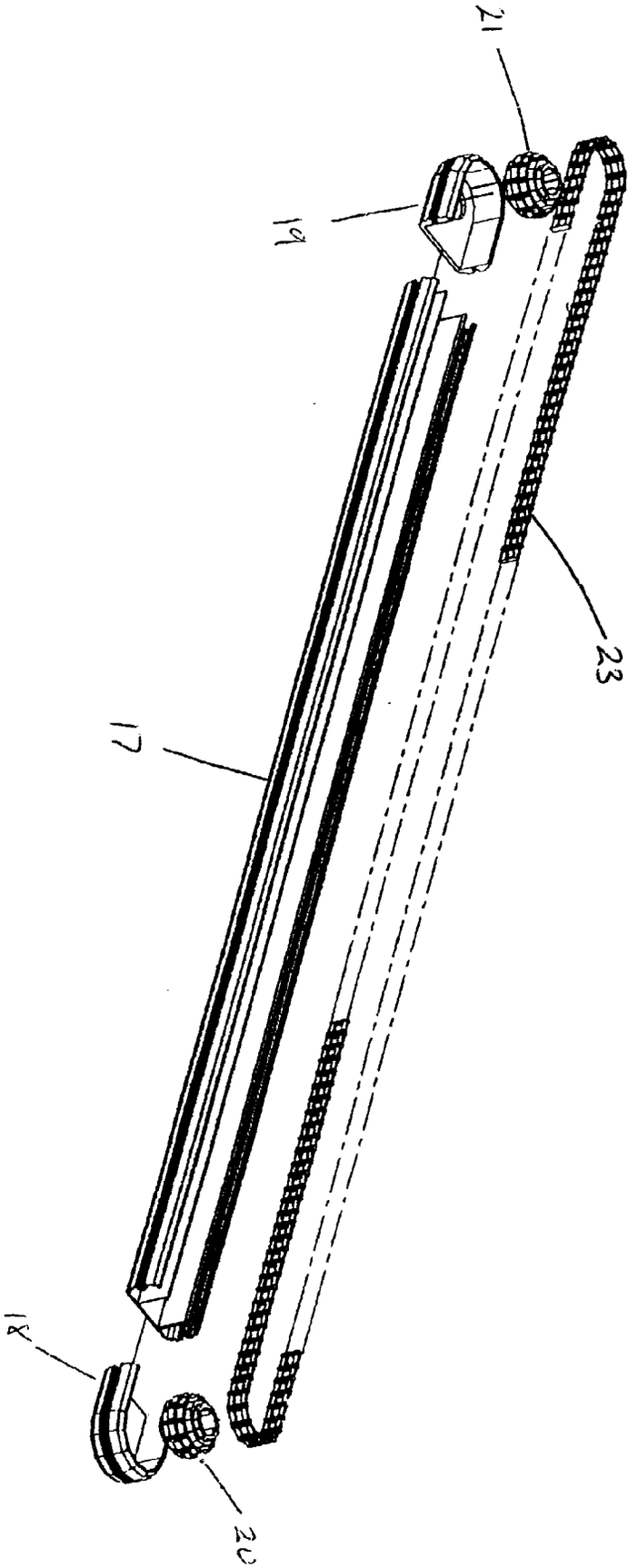


Fig 3

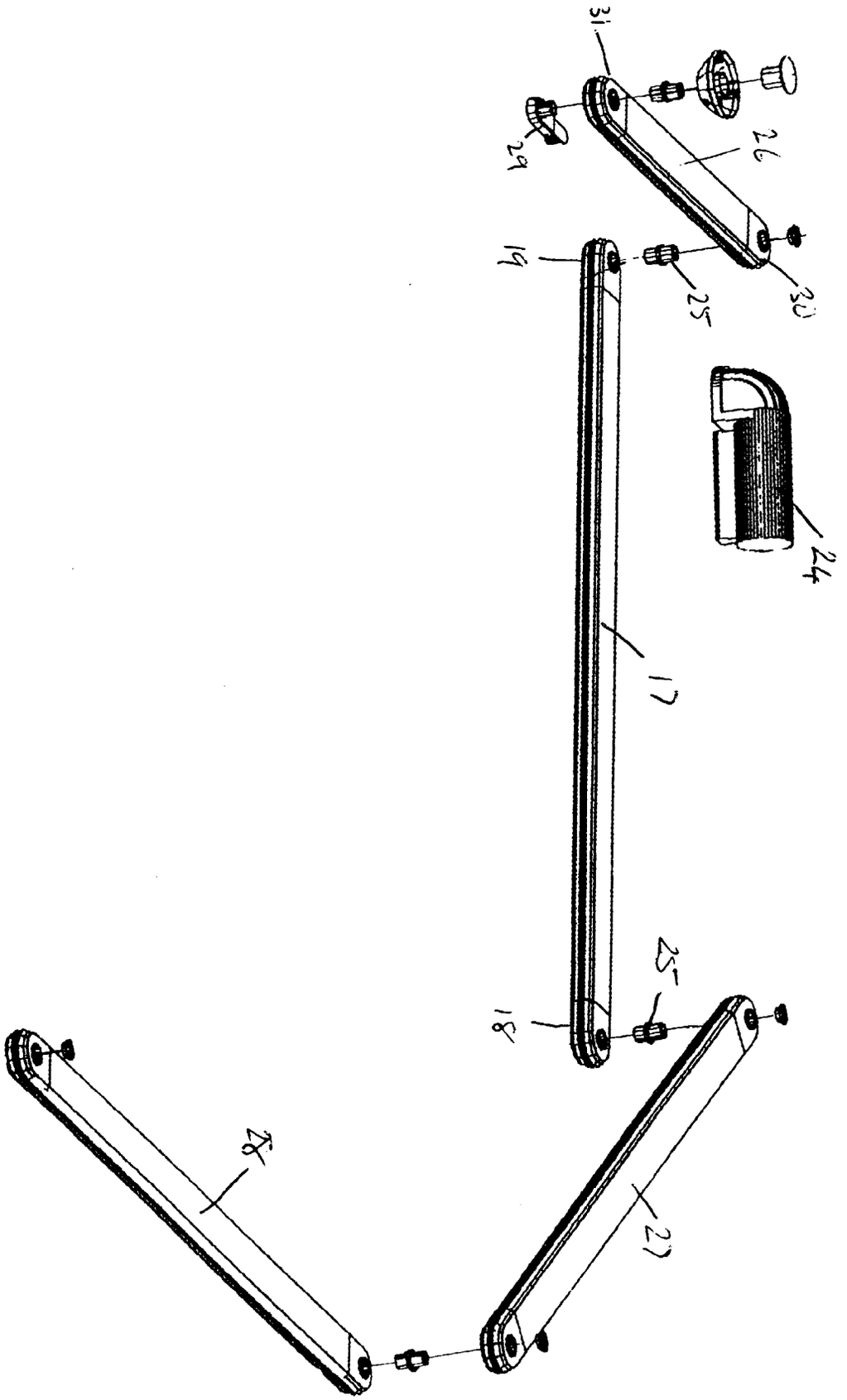


Figure 4