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DESCRIPTION

Description

TECHNICAL FIELD

[0001] The present subject matter generally relates to a chair, and more particularly, relates to a work chair which adapts to dynamic body postures of a user.

BACKGROUND

[0002] The modem workplace with increased use of network connectivity is reducing the need for people to move around in office for communication purpose. The intensely competitive nature of today's work culture has made tight deadlines and targets as innate part of long working schedule for most users, forcing them to remain seated for long hours. Further, even at home and in normal daily routine, due to increased use of technology and internet based social networking people tend to remain seated for long duration.

[0003] Ergonomic field studies indicate that static postures are associated with increasing number of health concerns. Static postures place a strain on the body, leading to fatigue and even spinal injuries over a period of time. No matter how comfortable is a chair, static seated postures can cause musculo-skeletal injuries and pain even after regular exercise. Furniture that would encourage frequent change in posture or help the users to be more active can prevent these risks associated with static positions adopted at work.

[0004] Hon (HNI group) has introduced a task/workstation chair comprising a seat and a back which can flex in multiple axes for allowing change in posture and providing support simultaneously. However, the back is connected with the seat towards its central axis and enables the multiple axes flexing only through a short distance from central pivot point. Hence, said task/workstation chair is neither very comfortable nor helps in dynamic body movements effectively due to its limited flex capabilities. Teknion, a U.S. based company introduced a multipurpose chair comprising an integrated seat and back, wherein the back provides flexing motion. However, Teknion's multipurpose chair lack flexibility, does not support the posture well and is not very efficient in terms of preventing risks associated with static positions of a user.

[0005] US-A-2699200 discloses a chair comprising a platform adapted to rest on a supporting surface, resilient loops carried by the platform and extending upwardly from the front adjacent opposite sides thereof, arms carried by the loops and extending rearwardly therefrom above

opposite sides of the platform, a seat mounted on the arms for movement in an arcuate path above the platform from an upright sitting position to an inclined reclining position, a curved post carried by the platform and extending upwardly therefrom beneath the seat, and a clamp carried by the seat and engaging the post for holding the seat in a selected position in its arcuate path.

[0006] Hence, there is a need identified for a chair which helps in efficient interaction between the user and surrounding elements with ease and comfort. Further, there is a need for a chair that assists dynamic body movements and supports body posture changes, minimizes the risks associated with static body postures during long duration sitting and overcomes aforementioned as well as other challenges in relation with sitting postures.

SUMMARY

[0007] The present subject matter relates to a chair which adapts to dynamic body postures of a user. The present invention provides a posture adaptive work chair as claimed in claim 1. Preferred features are set out in the dependent claims.

[0008] It is an object of the present subject matter to provide a chair designed to intuitively adapt to users' posture changes.

[0009] It is another object of the present subject matter to encourage users to be playfully active while sitting.

[0010] It is yet another object of the present subject matter to keep users' body alert thereby bringing focus at work and better productivity.

[0011] It is yet another object of the present subject matter to provide a chair having synchronous easy flex system enabling dynamic body movements in sitting condition.

[0012] It is yet another object of the present subject matter to provide a chair, wherein the seat and back are firmly connected to the base frame and are cantilevered in such a way that it gives a multi-dimensional movement possibility just with a simple lean on the sides or back, without need for complex manual adjustment.

[0013] It is yet another object of the present subject matter to provide a back tilt with variable limit adjustment with different positions based on nature of activity performed.

[0014] It is yet another object of the present subject matter to provide a chair comprising a knee point cantilevered seat and back frame which is appropriate for use in workplaces and homes.

BRIEF DESCRIPTION OF DRAWINGS

[0015] These and other features, aspects, and advantages of the present invention will become better understood when the following detailed description is read with reference to the accompanying drawings in which like characters represent like components throughout the drawings, wherein:

FIGURE 1 illustrates a perspective view of a chair in accordance with an embodiment of the present subject matter.

FIGURE 2 illustrates a side view of a chair in accordance with an embodiment of the present subject matter.

FIGURE 3a and 3b illustrate perspective views of an upholstered back sub-assembly with spine members and seat base sub-assembly in accordance with an embodiment of the present subject matter.

FIGURE 4a, 4b, 4c and 4d illustrate structure and operation of a tilt limiter of the chair in accordance with an embodiment of the present subject matter.

FIGURE 5 illustrate a perspective view of a visitor chair in accordance with an embodiment of the present subject matter.

DETAILED DESCRIPTION

[0016] The embodiments of the present subject matter are described in detail with reference to the accompanying drawings. However, the present subject matter is not limited to these embodiments which are only provided to explain more clearly the present subject matter to the ordinarily skilled in the art of the present disclosure. In the accompanying drawings, like reference numerals are used to indicate like components.

[0017] Described herein is a work chair, comprising a pedestal base member, a seat sub-assembly comprising a front edge and base sub-assembly, a back sub-assembly and an adjustable armrest sub-assembly. The back sub-assembly is supported by two spine members which are cantilevered from the front edge of the seat sub-assembly. The front edge can be defined as the portion where knees bend in sitting position. The back sub-assembly flexes in multiple axes as result of direction of load applied by a user's back on the work chair through the large cantilever formed by the spine members attached firmly at the front edge. For example, if the force applied on the back of the chair is acentric the flex will be also be acentric resulting in a 3 dimensional back movement based on the direction of load applied and following the posture adopted by the user. The spine members comprise of a combination of C-type and V-Type sections having continuous rib with cut-out in certain locations flexes

through its geometry and plastic material properties. The two spine members are connected also near the rear part of the seat through a spine connector aiding in structural stability and being integral part of the tilt limiting feature. In an embodiment, the spine members are made up of Glass filled Poly-Amide. However, the aforementioned material is exemplary and not limiting in any way. It is clear to person skilled in the art that the spine members may comprise of any other suitable material showing similar properties. The seat sub-assembly comprising a seat base sub-assembly and is cantilevered from the front edge enabling a smooth landing while sitting and providing with synchronous flexing movement with the back sub-assembly during posture changes. Further, flexing of the back sub-assembly can be restricted as per user's requirement at multiple positions through a tilt limiter lever adjustment mounted within the seat base sub-assembly. For example, the tilt limit lever can be operated to allow the flexing/reclining of the back sub-assembly in three different positions. Hereinafter, various modes of carrying out the aforementioned invention have been discussed with the help of illustrations.

[0018] FIGURE 1 illustrates a perspective view of a main chair 100 in accordance with an embodiment of the present subject matter. The main chair 100 comprises a seat sub-assembly 102 comprising a front edge 138 and base sub-assembly 124, a back sub-assembly 104, adjustable armrest sub-assembly 108 and pedestal base member 112. The back sub-assembly 104 is supported by two spine members 106 which are cantilevered from a front edge 124 of the seat sub-assembly 102. Further, the main chair 100 includes a plurality of components including but not limiting to two adjustable armrest sub-assemblies 108, a telescopic gas-lift cylinder 110 and a pedestal base member 112. The adjustable armrest sub-assembly 108 is provided on two laterally opposite sides of the seat sub-assembly 102 and can be used by a user to place arms on them in sitting position. The telescopic gas-lift cylinder 110 is fixedly attached between the pedestal base member 112 and the seat sub-assembly 102. Further, the telescopic gas-lift cylinder 110 is actuated longitudinally between the central axes of the pedestal base member 112 and the seat sub-assembly 102 respectively to adjust seat height of the work chair. The pedestal base member 112 is provided with a plurality of castors 114 for ease of displacement of the main chair 100 from one place to another.

[0019] FIGURE 2 illustrates a side view of the main chair 100 in accordance with an embodiment of the present subject matter. The main chair 100 comprises a plurality of adjustment features, for instance, a push button 116, a seat height adjustment lever 118 and a tilt limit lever 120. The push button 116 is provided to adjust height of the adjustable armrest sub-assembly 108 in longitudinal direction with a series of intermediate stopper positions starting from a bottom end 122 of the adjustable armrest sub-assembly 108. The seat height adjustment lever 118 is provided for adjusting height of the seat sub-assembly 102 from the pedestal base member 112 through actuation of the telescopic gas-lift cylinder 110. The height of the seat sub-assembly 102 is adjusted by operating the telescopic gas-lift cylinder 110 through the seat height adjustment lever 118.

[0020] FIGURE 3a and 3b illustrate perspective views of back sub-assembly 102 and the two spine members 106 in accordance with an embodiment of the present subject matter. As can

be seen from the figures, the spine members 106 is fixedly connected to a seat base sub-assembly 124 which is fixedly attached between the two spine members 106. The seat base sub-assembly 124 includes a plurality of box geometry with intersecting rib structure for strength. Further, curved portions of the spine members 106 include a plurality of organic shape slots / slits 126 for increasing flexibility of the spine members 106.

[0021] In an embodiment, the organic shape slots / slits 126 are flower-bud shaped for enhanced flexibility. Further, the spine members 106 comprise a combination blend of C-type and V-Type sections having continuous rib with cut-out in certain locations flexes through its geometry and plastic material properties. The plastic material is glass filled poly-amide. However, the aforementioned plastic member is disclosed for exemplary purpose only and is not to be construed limiting in any way as any suitable material which shows similar plastic properties can be used to form the spine members 106. Further, the left hand and right hand spine members can move in differential motion (3-Dimensional) resulting in multi-axis movement.

[0022] FIGURE 4a, 4b, 4c and 4d illustrate structure and operation of a tilt limit lever 120 of the main chair 100 in accordance with an embodiment of the present subject matter. As can be seen in Figures 4a to 4d, the tilt limit lever 120 is moveably coupled to the seat base sub-assembly 124 such that a handle of the tilt limit lever 120 is accessible from the outer side of one of the spine members 106. The tilt limit lever 120 further comprises a tilt angle position snap 140 which engage with a tilt angle position slot 142 which is integral with the seat base sub-assembly 124. The two spine members 106 are connected to a rear part of the seat base sub-assembly 124 through a spine connector 128. The spine connector 128 aids in structural stability and forms an integral part of tilt limiting feature through resting on the backrest stopper 130 at multiple tilt angle positions. When the tilt limit lever 120 is operated through its handle to shift from a first position 132 (upright position) to a second position 132' (mid tilt position), the backrest stopper 130 rotates to stop the back-spine connector 128 at a particular position.

[0023] In an embodiment, the tilt limiter can be shifted to three different positions - a first position 132 (upright position), a second postion132' (mid tilt position) and a third position 132" (full tilt position) resulting in three different back tilt angles of the back sub-assembly 104. In first position 132, the tilt angle of the back sub-assembly is maintained at upright position without tilting which can also be called as no tilt position. Said position results in completely upright position of the back sub-assembly 104 and when a user pushes against the back sub-assembly 104, the back sub-assembly 104 flexes about a point of mating of the backrest stopper 130 and the back-spine connector 128. Similarly, the back rest portion can be adjusted in three tilt positions corresponding to the first position 132, the second position 132' and the third position 132" namely upright position, mid tilt position and the full tilt position.

[0024] In operation, when the tilt limit lever 120 is pushed to shift for example from the first position 132 to the second position 132', the tilt limit lever 120 moves radially about a pivot 134 of the tilt limit lever 120 and a tilt angle position snap 140 engages in one of tilt angle position slots (142, 142', 142") corresponding to the first position 132, to the second position 132' and

to the third position 132" respectively thus achieving resistance and positive feedback between the multiple tilt limit settings. Upon the radial motion of the tilt limit lever 120, a tilt limit lever connector 136 which is connected to the backrest stopper 130 moves linearly. Further, the linear motion of the tilt limit lever connector 136 results into rotary motion of the backrest back stopper 130 which limits the back-spine connector 128 at a particular position.

[0025] In an embodiment, at the mid tilt position, the back sub-assembly 104 tilts up to a mid tilt position about the point where the spine member 106 is cantilevered from the front edge of the seat sub-assembly 102 and beyond that flexes about the point of mating of the backrest stopper 130 and the back-spine connector 128 when further pushed by the user. Similarly, in the full tilt position, the back sub-assembly 104 tilts to a full tilt position of the adjusting range about the point where the spine member 106 is cantilevered from the front edge of the seat sub-assembly 102 and beyond that flexes about the point of mating of the backrest stopper 130 and the back-spine connector 128 at a particular position.

[0026] In an embodiment, as shown in Figure 5, the visitor chair 100' comprises an visitor chair base frame structure 138affixed with the spine members 106' to support the spine members 106', wherein the angular metal base 138 acts as an understructure for the visitor chair 100'. The visitor chair 100 according to the present embodiment illustrates a simple aspect of the present invention and replicates upright position feature of main chair 100 as seen in the first position tilt limit position 132 having restricted tilting. The visitor chair 100' is simple, cost-effective version of the main chair 100 and is often used in visitor seating applications.

[0027] As can be seen from, the work chair is capable of assisting dynamic body movements, supporting posture efficiently and minimizing the risks associated with static positions.

[0028] Although the invention has been described with reference to specific embodiments, this description is not meant to be construed in a limiting sense. Various modifications of the disclosed embodiments, as well as alternate embodiments of the invention, will become apparent to persons skilled in the art upon reference to the description of the invention. It is therefore contemplated that such modifications can be made without departing from scope of protection as defined in the appended claims.

REFERENCES CITED IN THE DESCRIPTION

Cited references

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all

liability in this regard.

Patent documents cited in the description

- US2699200A [0005]

PATENTKRAV

1. En stillingsadaptiv arbejdsstol (100), der omfatter:

en sædeunderenhed (102), der har en forkant (138) og en sædebaseunderenhed (124),

et par ryglænselementer (106), der rager ud fra sædeunderenhedens (102) forkant (124),

en rygunderenhed (104), der understøttes af parret af ryglænselementer (106), hvilken rygunderenhed (104) er indrettet til at bøje sig i flere akser baseret på den belastningsretning, der påføres af en bruger, og

et vippebegrænsningshåndtag (120), der er bevægeligt koblet til sædebaseunderenheden (124), hvilket vippebegrænsningshåndtag (120) er indrettet til at muliggøre vipning af rygunderenheden (104) til en flerhed af vippepositioner (132, 132', 132"),

hvor vippebegrænsningshåndtaget (120) er bevægeligt forbundet med et vippehåndtagsforbindelseselement (136), således at radial bevægelse af vippebegrænsningshåndtaget (120) resulterer i lineær bevægelse af vippehåndtagsforbindelseselementet (136),

kendetegnet ved, at vippebegrænsningshåndtaget (120) omfatter et vippevinkelpositionsklikelement (140), der er indrettet til at gå i indgreb med mindst én vippevinkelpositionsrille (142, 142', 142") for hver vippeposition (132, 132', 132"), når nævnte vippebegrænsningshåndtag (120) bevæger sig radialt omkring et drejepunkt (134) af vippebegrænsningshåndtaget (120), og ved, at vippehåndtagsforbindelseselementet (136) er roterbart forbundet med et ryglænsstop (130), således at lineær bevægelse af vippehåndtagsforbindelseselementet (136) resulterer i rotationsbevægelse af ryglænsstoppet (130), der er indrettet til at gå i indgreb med et ryglænsforbindelseselement (128) i hver vippeposition (132, 132', 132").

2. En stillingsadaptiv arbejdsstol (100) ifølge krav 1, hvor parret af ryglænselementer (106) er fast forbundet med en bageste del af sædebaseunderenheden (124) gennem et ryglænsforbindelseselement (128), hvilket ryglænsforbindelseselement (128) er indrettet til at muliggøre vipning af rygunderenheden (104) til flerheden af vippepositioner (132, 132', 132").

3. En stillingsadaptiv arbejdsstol (100) ifølge krav 1 og 2, hvor hvert af ryglænselementerne (106) omfatter:

en buet del, der har en flerhed af riller (126) med henblik på at øge fleksibiliteten af hvert af ryglænselementerne (106), og

et antal sektioner, der har kontinuerlige ribber med udskæringer for at muliggøre bøjning af hvert af ryglænselementerne (106).

4. En stillingsadaptiv arbejdsstol (100) ifølge krav 1, hvor mindst én justerbar armlænsunderenhed (108) er anbragt på hver af de lateralt modstående sider af sædeunderenheden (102) med henblik på at understøtte brugerens arme i siddestilling,

mindst én justerbar armlænsunderenhed (108), således at armlænsunderenhedens (108) højde justeres i længderetningen ved betjening af en trykknap (116).

5. En stillingsadaptiv arbejdsstol (100) ifølge krav 1, hvor et sokkelbaseelement (112) er fast forbundet med sædebaseunderenheden (124),
hvilket sokkelbaseelement (112) omfatter en flerhed af kørehjul (114), der er roterbart fastgjort på den nederste del af sokkelbaseelementet (112) med henblik på at flytte arbejdsstolen (100) fra ét sted til et andet.

6. En stillingsadaptiv arbejdsstol (100) ifølge krav 1 og 5, hvor en teleskopisk gasløftecylinder (110) er fast forbundet mellem sokkelbaseelementet (112) og sædebaseunderenheden (124), hvilken teleskopisk gasløftecylinder (110) aktiveres ved betjening af et sædejusteringshåndtag (116) med henblik på at justere arbejdsstolens (100) højde.

7. En stillingsadaptiv arbejdsstol (100) ifølge krav 1, hvor hver vippeposition (132, 132', 132") udføres ved, at brugeren betjener vippebegrænsningshåndtaget (120) eller påfører belastning på rygunderenheden med henblik på at opnå forskellige vippepositioner (132, 132', 132") af rygunderenheden (104).

8. En stillingsadaptiv arbejdsstol (100') ifølge krav 1, der omfatter en understelkonstruktion (138), som er fast forbundet til parret af ryglænselementer (106), idet parret af ryglænselementer (106') understøtter, at rygunderenheden vippes i en opretstående position (132) af nævnte vippepositioner (132, 132', 132'), hvor den kropsholdning tilpasbare arbejdsstol er en gæstestol.

DRAWINGS

Drawing

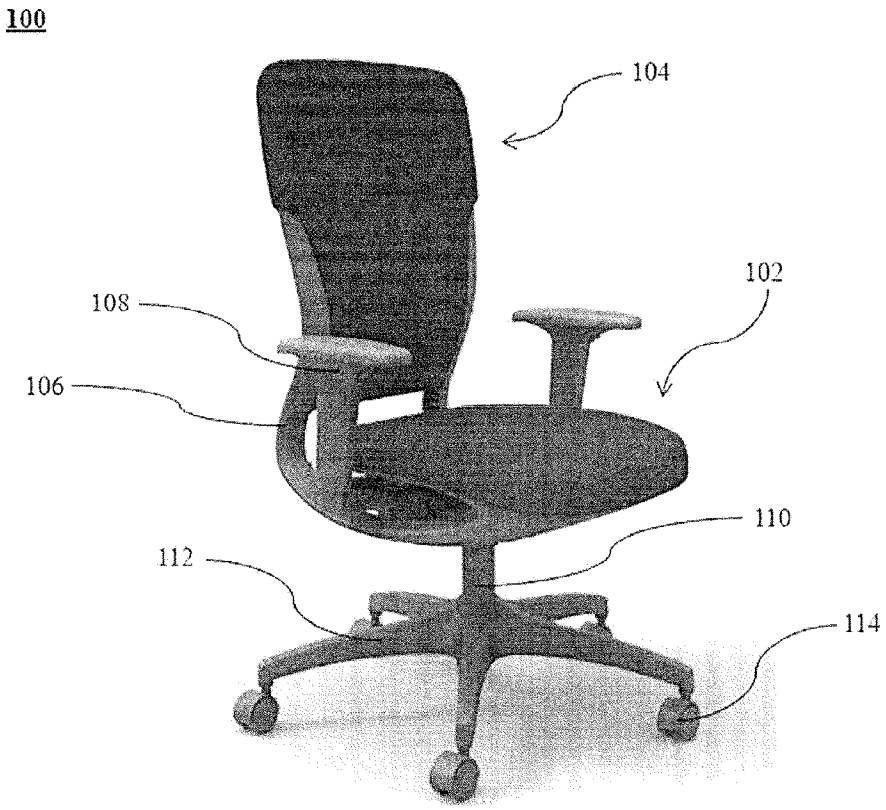


FIGURE 1

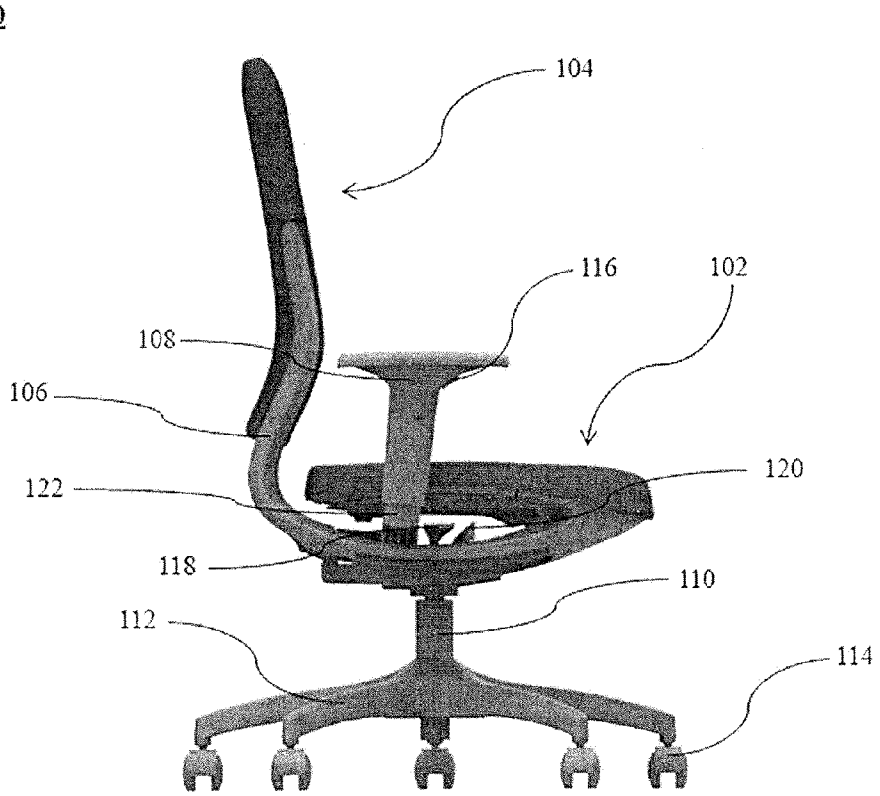


FIGURE 2

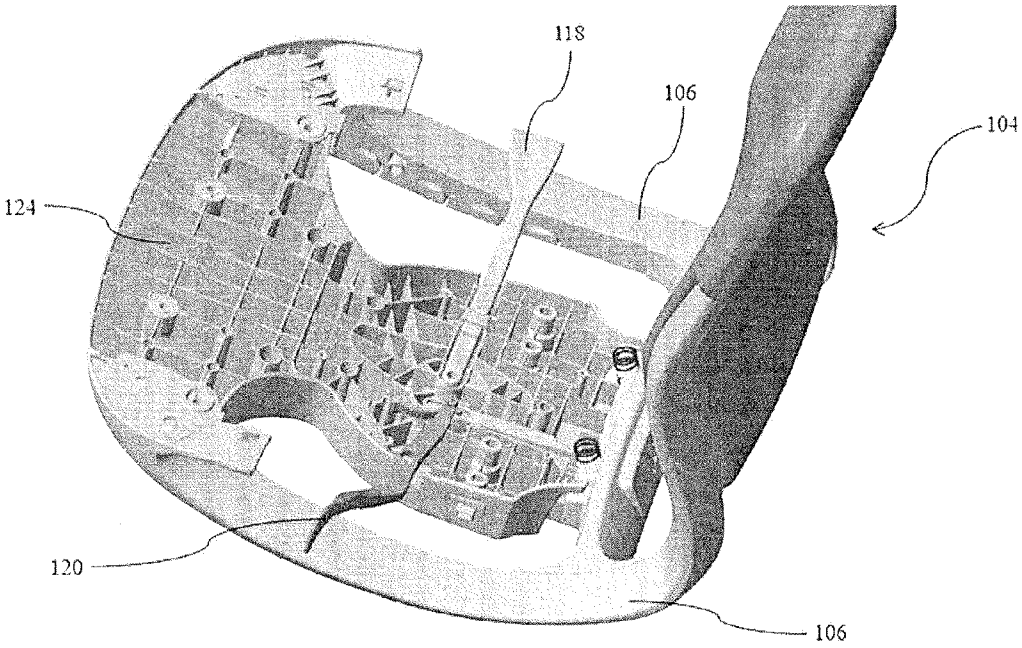


FIGURE 3a

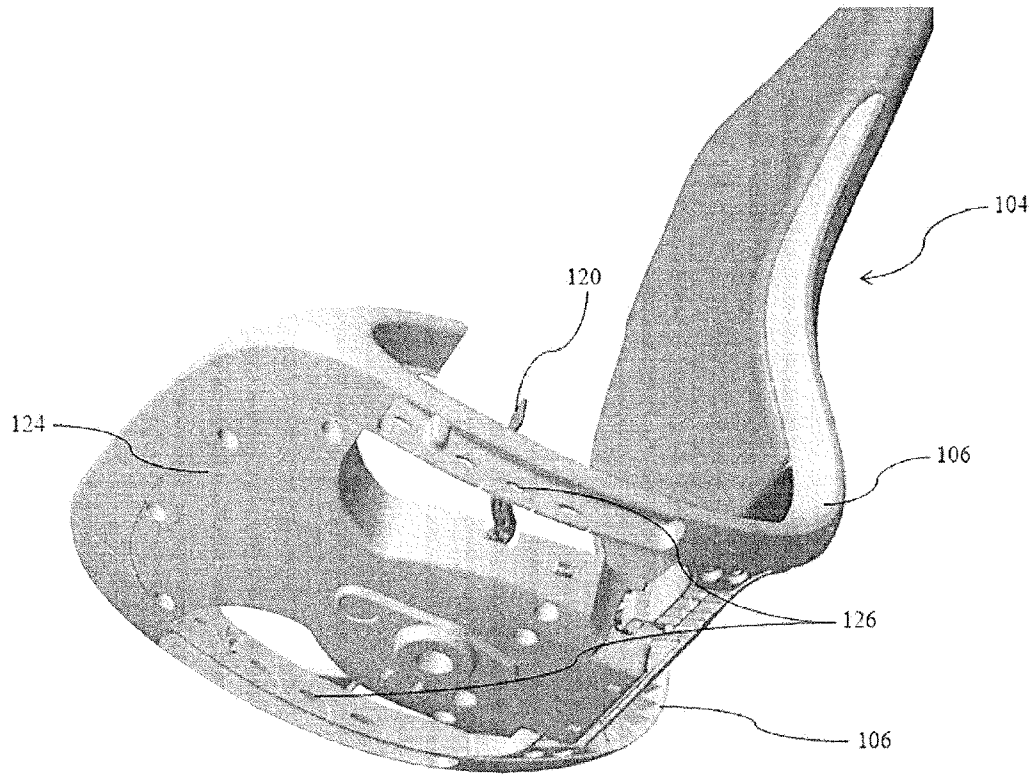


FIGURE 3b

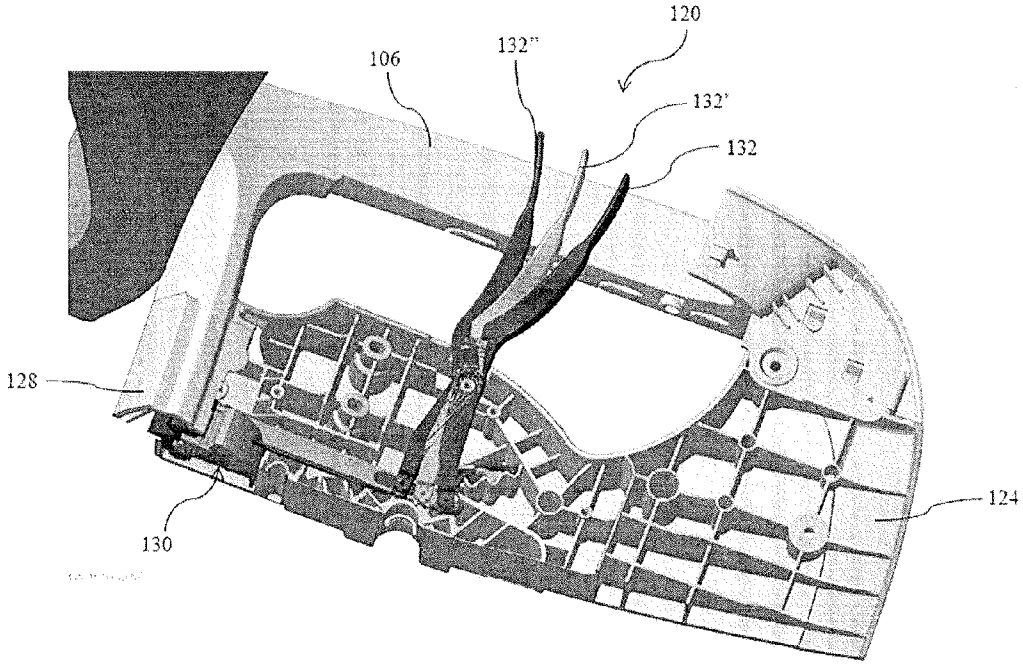


FIGURE 4a

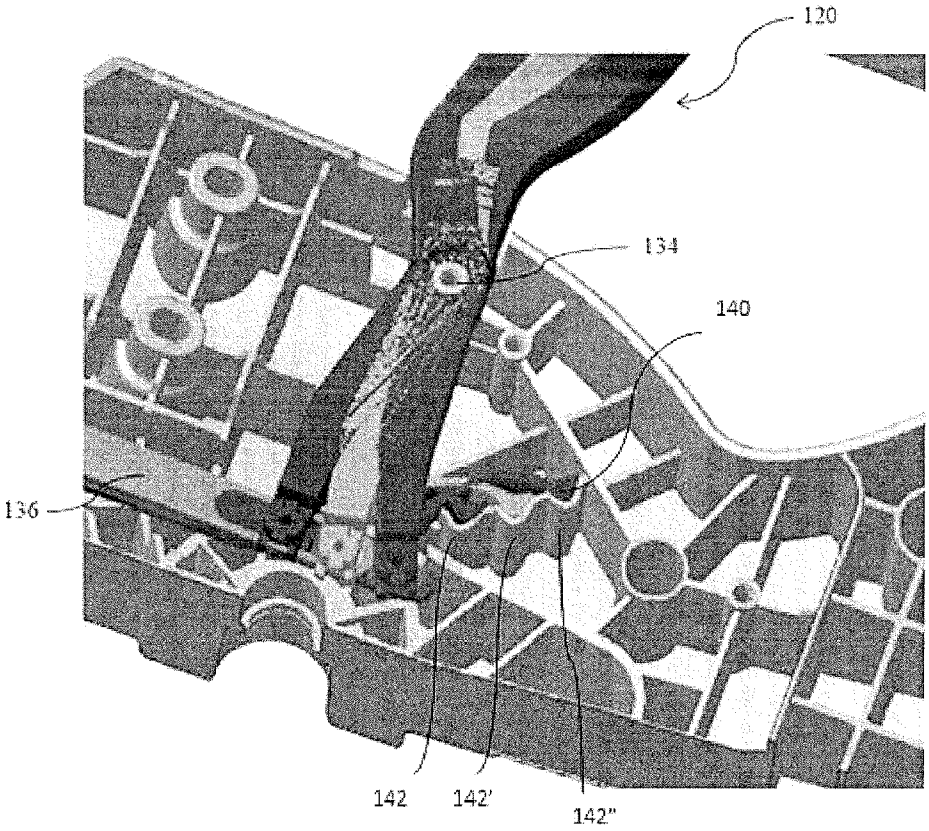


FIGURE 4b

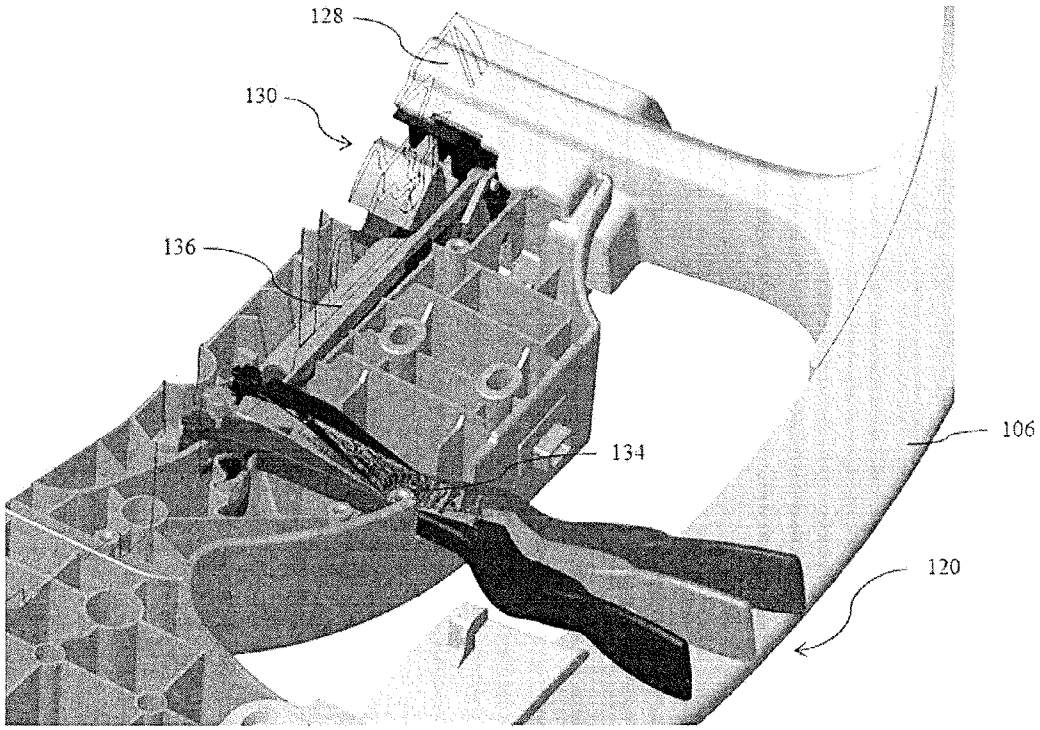


FIGURE 4c

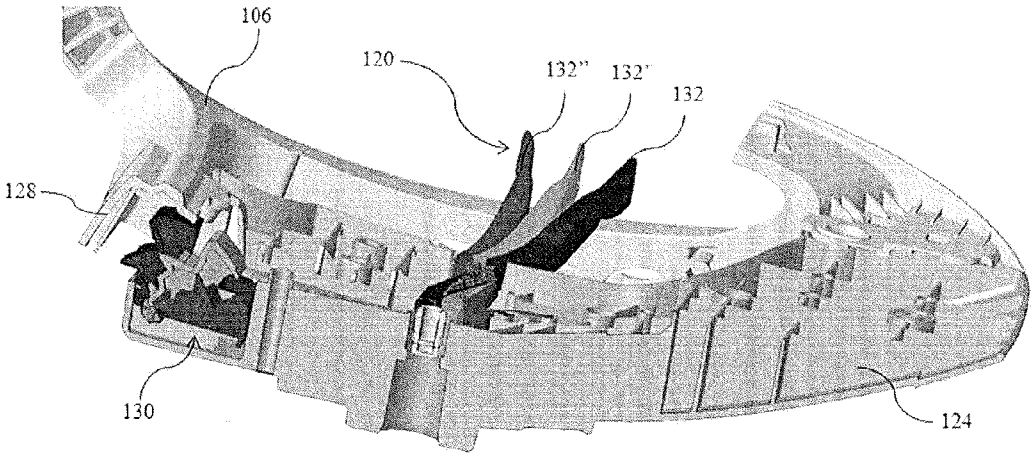


FIGURE 4d



FIGURE 5