		JP-2018520740-A OR GB-2341790-A OR DK-179639-B1 OR US-20180160799-A1 OR WO-2016200318-A1 OR EP-3307108-A1 OR CN-107708486-A OR WO-2016200318-A8 OR WO-2018137739-A1 OR US-9713375-B1 OR DK-201700050-A1 OR US-20180103752-A1 OR US-10258149-B2 OR US-20180255919-A1 OR JP-2017513663-A OR US-10542817-B2 OR US-20150272316-A1).did.	IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L4594	132	("20180125227" OR "10018298" OR "10023355" OR "10114352" OR "10123613" OR "10244861" OR "10258149" OR "10264877" OR "10306977" OR "10413055" OR "10524565" OR "10542817" OR "10544019" OR "10568416" OR "10575630" OR "10869549" OR "11083282" OR "11140977" OR "11147366" OR "1318564" OR "20030042380" OR "20030213415" OR "20070001077" OR "20070080564" OR "20070266912" OR "20080000393" OR "20100242174" OR "20120097822" OR "20120188302" OR "20130193392" OR "20150216296" OR "20160338486" OR "20160353880" OR "20170071332" OR "20170196351" OR "20180177289" OR "20180213929" OR "20180279770" OR "20190110588" OR	(US-PGPUB; USPAT)	OR	ON	ON	2022/09/21 01:52 PM

		"20190183239" OR "20190269237" OR "20200029685" OR "20200107633" OR "2843418" OR "2937003" OR "3295800" OR "4221280" OR "4448386" OR "4449262" OR "4549720" OR "4558648" OR "4577821" OR "4625657" OR "4640488" OR "4702454" OR "4709972" OR "4717112" OR "4753419" OR "4826123" OR "4843978" OR "4941641" OR "4967672" OR "4995130" OR "5037163" OR "5048784" OR "5211367" OR "5251864" OR "5257767" OR "5294087" OR "5400720" OR "5588377" OR "5626323" OR "5722513" OR "5765797" OR "5829948" OR "5836562" OR "5926876" OR "5957426" OR "6076785" OR "6098961" OR "6148739" OR "6176456" OR "6179261" OR "6269753" OR "6273382" OR "6488248" OR "6516478" OR "6533229" OR "6533479" OR "6672430" OR "6701853" OR "6702372" OR "6722618" OR "6742768" OR "6792876" OR "6938866" OR "7048236" OR				

		"7188813" OR "7204193" OR "7207629" OR "7246784" OR "7575205" OR "7841570" OR "7845665" OR "7946551" OR "7950338" OR "8015638" OR "8132518" OR "8303062" OR "8469152" OR "8490933" OR "8544391" OR "8671853" OR "8684339" OR "8950343" OR "9049923" OR "9055810" OR "9232855" OR "9326598" OR "9480332" OR "9504316" OR "9554644" OR "9668572" OR "9681746" OR "9809136" OR "9854904" OR "9955780" OR "9981571" OR "9993068" OR "D830739" OR "D870490" OR "D901959").pn.					
L4595	26	("4221280" | "4577821" | "4995130" | "5186038" | "5322143" | "5588377" | "9161616" | "D845037" | "10264877" | "10517390" | "20100012909" | "20140041554" | "20160338486" | "20170354245" | "20180055214" | "20180146775").pn. OR ("10869549").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4596	124	("1318564" | "2937003" | "3295800" | "3826457" | "4221280" | "4449262" | "4549720" | "4558648" | "4577821" | "4702454" | "4741512" | "4753419" | "4843978" | "D302893"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		| "4941641" | "4967672" | "4995130" | "5037163" | "5211367" | "5251864" | "5257767" | "5294087" | "5400720" | "5588377" | "5626323" | "5765797" | "5829948" | "5926876" | "5957426" | "6076785" | "6098961" | "6269753" | "6516478" | "6533229" | "6533479" | "6672430" | "6701853" | "6702372" | "6722618" | "6742768" | "6792876" | "7048236" | "7204193" | "7207629" | "7575205" | "7677518" | "7841570" | "7845665" | "7950338" | "8015638" | "8132518" | "8303062" | "8469152" | "8490933" | "8544391" | "8671853" | "8684339" | "8931750" | "8950343" | "9049923" | "9055810" | "9232855" | "9326598" | "9480332" | "9504316" | "9554644" | "9681746" | "9809136" | "9815672" | "9955780" | "9981571" | "9993068" | "10018298" | "10023355" | "D830739" | "10123613" | "D845037" | "10244861" | "10258148" | "10258149" | "10306977" | "D854775" | "10413055" | "10499730" | "10517390" | "10524565" | "10542817" | "10544019" | "10568416" | "10575630" | "D901959" | "10869549" | "10893748" | "20030213415" | "20050120922" | "20070080564" | "20070266912" | "20080000393" | "20090145336" | "20100242174" | "20110001033" | "20120097822" | "20120188302" | "20130193392" | "20140144352" |					

		"20150216296" | "20150289641" | "20160338486" | "20160353880" | "20170071332" | "20170174486" | "20170196351" | "20170354245" | "20180055214" | "20180177289" | "20200029685" | "20200107633").pn. OR ("11134774").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4597	87	("1318564" | "2937003" | "3295800" | "4221280" | "4558648" | "4577821" | "4843978" | "5037163" | "5211367" | "5257767" | "5588377" | "5626323" | "5829948" | "5957426" | "6076785" | "6098961" | "6269753" | "6516478" | "6533479" | "6701853" | "6722618" | "6742768" | "6792876" | "7677518" | "7841570" | "7950338" | "8132518" | "8544391" | "8671853" | "8684339" | "8931750" | "9049923" | "9326598" | "9480332" | "9504316" | "9554644" | "9681746" | "10159336" | "10244861" | "10258148" | "10258149" | "10499730" | "10542817" | "20030213415" | "20040040480" | "20070080564" | "20080000393" | "20120097822" | "20130193392" | "20130199420" | "20140144352" | "20140158026" | "20150232005" | "20150368082" | "20150375896" | "20160051042" | "20160106205" | "20160170402" | "20160260019" | "20160309889" | "20160338486" |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		"20160353880" | "20170174486" | "20170360192" | "20180008037" | "20180125227" | "20180177289" | "20180279770" | "20180360208" | "20190110588" | "20190269237" | "20200029685").pn. OR ("10893748").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4598	162	("1824822" | "2545515" | "2579577" | "2581023" | "2630359" | "2727799" | "2798641" | "3203373" | "3245366" | "3347184" | "3727245" | "3888451" | "4032103" | "4073240" | "4130069" | "4194452" | "4515086" | "4534544" | "4558847" | "4577821" | "4589621" | "4625657" | "4728118" | "4981052" | "4981085" | "5039054" | "5048784" | "5083512" | "5088676" | "5174223" | "5192053" | "5251864" | "5322025" | "5325794" | "5375514" | "5394809" | "5490466" | "5503086" | "5549052" | "5553550" | "5588377" | "5649493" | "5680820" | "5687655" | "5778799" | "5794911" | "5823120" | "5833198" | "5938340" | "5967059" | "6026755" | "6038986" | "6283047" | "6286441" | "6378446" | "6439657" | "6510803" | "6516478" | "6520091" | "6603157" | "6691626" | "6701853" | "6874431" | "6991199" | "7048236" | "7059254" | "7201108" | "7246784" | "7385376" | "7548051" | "7642759" | "7654208" | "7677518" | "7690317" | "7849789" | "7887014" | "7950338" | "8065966" | "8132518" | "8439319" | "8544391" | "8671853" | "8783639" | "8800454" | "8931750" | "8950343" | "9049923" | "9055810"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		| "9072645" | "9113703" | "9668572" | "20020189505" | "20030213415" | "20040187742" | "20040227443" | "20050041721" | "20050248239" | "20060037518" | "20060038383" | "20060157628" | "20070163475" | "20070259554" | "20070266912" | "20070295882" | "20080308016" | "20090179121" | "20100242174" | "20100257671" | "20110120351" | "20110168062" | "20110247532" | "20130014674" | "20130139736" | "20130145972" | "20130199420" | "20130340655" | "20140020606" | "20140041554" | "20140144352" | "20140158026" | "20140165882" | "20140360411" | "20150164218" | "20150216296" | "20150231992" | "20150250303" | "20150289641" | "20160120300" | "20160198853" | "20160278515" | "20160338486" | "20170354245" | "20170360188" | "20180103752" | "20180146775" | "20180160799" | "20180213929" | "20180279772").pn. OR ("10542817").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4599	87	("1318564" | "2937003" | "3295800" | "4221280" | "4558648" | "4577821" | "4843978" | "5037163" | "5211367" | "5257767" | "5588377" | "5626323"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		| "5829948" | "5957426" | "6076785" | "6098961" | "6269753" | "6516478" | "6533479" | "6701853" | "6722618" | "6742768" | "6792876" | "7677518" | "7841570" | "7950338" | "8132518" | "8544391" | "8671853" | "8684339" | "8931750" | "9049923" | "9326598" | "9480332" | "9504316" | "9554644" | "9681746" | "10159336" | "10244861" | "10258148" | "10258149" | "10499730" | "10542817" | "20030213415" | "20040040480" | "20070080564" | "20080000393" | "20120097822" | "20130193392" | "20130199420" | "20140144352" | "20140158026" | "20150232005" | "20150368082" | "20150375896" | "20160051042" | "20160106205" | "20160170402" | "20160260019" | "20160309889" | "20160338486" | "20160353880" | "20170174486" | "20170360192" | "20180008037" | "20180125227" | "20180177289" | "20180279770" | "20180360208" | "20190110588" | "20190269237" | "20200029685").pn. OR ("10893748").urpn. AND (PGPB | USPT | USOC).dbnm.				
L4600	33	("136357" | "2624535" | "2733109" | "3001559" | "4967672" | "5588377" | "5636711" | "5829948" | "7032872" | "7059616" | "7677518" | "20140144352").pn. OR	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		("8950343").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4601	8	("2012/0188302").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4602	22	("2005/0120922").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4603	870	A47B1/03.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4604	17703	A47B21/0314,00,02,03.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4605	1350	A47B21/0314,00,02,03.cpc. AND ((pnuematic OR gas) ADJ spring OR actuator)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4606	162	("3140894"|"4926760"|"5588377"|"7640869"|"9113703"|"9615655"|"20160120300"|"6974185"|"9161616"|"5649493"|"8544391"|"9055810"|"9480332"|"9554644"|"20160249737"|"2531856"|"3494662"|"8016305"|"9644378"|"9681746"|"2922685"|"9326598"|"9625929"|"3161161"|"8936306").PN.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4607	88	("2156148"|"20040040480"|"20080203865"|"20130139736"|"20140041554"|"20150216296"|"20150289641"|"20160286951"|"20160338486"|"3245366"|"4691888"|"5588377"|"8544391"|"9326598"|"9480332"|"950	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM

		4316").PN.					
L4608	1313	312/208.1,223.3.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4609	0	248/421,562,588, "585,431,432,439".cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4610	0	248/421,562,588,585,431,432,439.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4611	3921	248/421,562,588,585,431,432,439.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4612	2881	248/421,562,588,585.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4613	1060	248/431,432,439.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4614	3035	108/147,144.11,145,93.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT;	OR	ON	ON	2022/09/21 01:52 PM

			IBM_TDB)				
L4615	1049	108/96,116.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4616	3238	108/118,120,43,138,50.01,50.02.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4617	1877	108/118,120,43,138.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4618	1396	108/50.01,50.02.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4619	550	("7841570"|"8684339"|"5037163"|"10258148"|"8469152"|"9815672"|"10869549"|"10893748"|"20170071332"|"4843978"|"9681746"|"9809136"|"D830739"|"D854775"|"D901959"|"8671853"|"9504316"|"20040040480"|"20050120922"|"20180055214"|"6672430"|"8015638"|"9681746"|"10258148"|"10306977"|"1318564"|"20030213415"|"20050120922"|"20080000393"|"20170354245"|"20200107633"|"4558648"|"4702454"|"5829948"|"6701853"|"8015638"|"D302893"|"10244861"|"7575205"|"10542817"|"20160353880"|"5211367"|"10893748"|"49	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM

		95130"|"9504316"|"D830739"|"10544019"|"10575630"|"4221280"|"4449262"|"4549720"|"5251864"|"6269753"|"6516478"|"6792876"|"7207629"|"10524565"|"4753419"|"4941641"|"8303062"|"8544391"|"9480332"|"9554644"|"20160309889"|"5257767"|"20150289641"|"20180103752"|"10023355"|"20070080564"|"20150289641"|"2937003"|"4995130"|"5400720"|"5626323"|"5926876"|"6533229"|"6702372"|"6722618"|"6742768"|"9055810"|"7845665"|"4967672"|"20100242174"|"9049923"|"10413055"|"20070266912"|"20200029685"|"3295800"|"4741512"|"5294087"|"5957426"|"7048236"|"8490933"|"8950343"|"9232855"|"9993068"|"9326598"|"D854775"|"10123613"|"10258149"|"20140144352"|"20150216296"|"6076785"|"6098961"|"9815672"|"9955780"|"20180177289"|"7677518"|"8931750"|"10499730"|"20160051042"|"6076785"|"4741512"|"20090145336"|"20160338486"|"7204193"|"7950338"|"8132518"|"20070001077"|"5400720"|"D302893"|"10517390"|"10568416"|"20120097822"|"20130193392"|"20170196351"|"3826457"|"4577821"|"5588377"|"5765797"|"6533479"|"6672430"|"8469152"|"10018298"|"9981571").PN.					
L4620	25	("3282566" | "4273306" | "5400720" | "5632209" | "5649493" | "9326598" | "20130340655" | "20140360414" | "20150289641" | "20180055214").pn. OR ("10517390").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

L4621	56	("1453406" | "1581874" | "2013542" | "2563060" | "2928558" | "3094948" | "3203670" | "3282566" | "4531720" | "4577821" | "4685731" | "4705438" | "4723769" | "4760997" | "4767109" | "4796029").pn. OR ("5400720").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4622	25	("3219338" | "4558648" | "4741512" | "5400720" | "5695173" | "5823120" | "6672430" | "9326598" | "9504316" | "9815672" | "20030154890" | "20050120922" | "20130341984" | "20170174486" | "20170340104").pn. OR ("10258149").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4623	76	("226053" | "4403680" | "4515086" | "4926760" | "5632209" | "5829948" | "6038986" | "6112858" | "6286812" | "6397763" | "6585214" | "6679479" | "6705238" | "6857493" | "7677518" | "7950338" | "8015638" | "8424883" | "8469152" | "9055810" | "9133976" | "20040040480" | "20070034125" | "20130145972" | "20150289641").pn. OR ("9504316").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4624	56	("D166377" | "D280478" | "D304112" | "D352845" | "D371687" | "D395969" | "D415910" | "D424828" | "D435368" | "D435986" | "D436268" | "D464212" | "D530939" | "D612643" | "D644046" | "D671338" | "D681979" | "D694044" | "D716074" | "D733476" | "D734413" |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		"D771981" | "D771982" | "9504316" | "D781617" | "D781618" | "D781619" | "D784050" | "20080178779" | "20130139736" | "20150096472" | "20160106205" | "20160278515" | "20170105518" | "20170196351" | "20170290413" | "20170354245").pn. OR ("D830739").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4625	50	("3472183" | "3820631" | "4488326" | "4741512" | "4995130" | "5113972" | "D346254" | "D375602" | "5588377" | "D378155" | "5833198" | "6651775" | "6814188" | "D640030" | "D640440" | "8015638" | "D771982" | "9615655" | "D814736" | "9961991" | "D825131" | "D827241" | "D830739" | "D832623" | "20120034055" | "20130139736" | "20140014886" | "20140027693" | "20150159803" | "20150289641" | "20170049224" | "20170240396" | "20180103752" | "20180177289" | "20180184797" | "20180206630" | "20180255919").pn. OR ("D854775").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4626	2518	A47B9/16.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4627	2081	A47B2021/0321,0364.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR,	OR	ON	ON	2022/09/21 01:52 PM

			GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L4628	10819	(A47B3/00 OR A47B61/00).cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4629	182	(A47B3/00 OR A47B61/00).cpc. AND ((pnuematic OR gas) ADJ spring OR actuator)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4630	3649	A47B3/02,0809,0815.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4631	1712	A47B3/0809,0815.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4632	513	(A47B3/02 AND A47B2003/025).cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4633	1267876	(desk$4 OR table$4) AND ((pnuematic OR gas) ADJ spring OR actuator)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4634	5666298	(desk$4 OR table$4) AND (X OR cross) ADJ (member OR arm)((pnuematic OR	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR,	OR	ON	ON	2022/09/21 01:52 PM

		gas) ADJ spring OR actuator)	GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L4635	3703	(desk$4 OR table$4) AND (X OR cross) ADJ (member OR arm) SAME ((pnuematic OR gas) ADJ spring OR actuator)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4636	869	(desk$4 OR table$4) SAME (X OR cross) ADJ (member OR arm) SAME ((pnuematic OR gas) ADJ spring OR actuator)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4637	91	(desk$4 OR table$4) SAME (X OR cross) ADJ (member OR arm) SAME ((pnuematic OR gas) ADJ (spring OR actuator))	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4638	305	(desk$4 OR table$4) AND (X OR cross) ADJ (member OR arm) SAME ((pnuematic OR gas) ADJ (spring OR actuator))	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4639	56	"9815672"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4640	202	("7841570"|"8684339"|"5037163"|"10258148"|"8469152"|"9815672"|"10869549"|"10893748"|"20170071332"|"4843978"|"9681746"|"9809136"|"D830739"|"D854775"|"D901959"|"8671853"|"9504316"|"20040040480"|"20050120922"|"20180055214"|"6672430"|"8015638"|"9681746"|"10	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO))	OR	ON	ON	2022/09/21 01:52 PM

		258148"|"10306977"|"1 318564"|"20030213415 "|"20050120922"|"2008 0000393"|"2017035424 5"|"20200107633"|"455 8648"|"4702454"|"5829 948"|"6701853"|"80156 38"|"D302893"|"102448 61"|"7575205"|"105428 17"|"20160353880"|"52 11367"|"10893748"|"49 95130"|"9504316"|"D83 0739"|"10544019"|"105 75630"|"4221280"|"444 9262"|"4549720"|"5251 864"|"6269753"|"65164 78"|"6792876"|"720762 9"|"10524565"|"475341 9"|"4941641"|"8303062" |"8544391"|"9480332"|" 9554644"|"2016030988 9"|"5257767"|"2015028 9641"|"20180103752"|" 10023355"|"200700805 64"|"20150289641"|"29 37003"|"4995130"|"540 0720"|"5626323"|"5926 876"|"6533229"|"67023 72"|"6722618"|"674276 8"|"9055810"|"7845665" |"4967672"|"201002421 74"|"9049923"|"104130 55"|"20070266912"|"20 200029685"|"3295800"| "4741512"|"5294087"|"5 957426"|"7048236"|"84 90933"|"8950343"|"923 2855"|"9993068"|"9326 598"|"D854775"|"10123 613"|"10258149"|"2014 0144352"|"2015021629 6"|"6076785"|"6098961" |"9815672"|"9955780"|" 20180177289"|"767751 8"|"8931750"|"1049973 0"|"20160051042"|"607 6785"|"4741512"|"2009 0145336"|"2016033848 6"|"7204193"|"7950338" |"8132518"|"200700010 77"|"5400720"|"D30289 3"|"10517390"|"105684 16"|"20120097822"|"20 130193392"|"20170196 351"|"3826457"|"45778 21"|"5588377"|"576579 7"|"6533479"|"6672430" |"8469152"|"10018298"|					

		"9981571").PN.					
L4641	67	"5400720"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4642	84	"4577821"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4643	24	(Artificial Intelligence) More like doc: US-D854775-S Text: (WO-0068597-A1 OR DE-4336662-A1 OR US-5694864-A OR AT-149474-T OR US-D378155-S OR US-D375602-S OR US-D346254-S OR US-D825131-S OR US-D814736-S OR US-D640440-S OR US-D837970-S OR TW-201522199-A OR TW-I531523-B OR US-20100012909-A1 OR US-D794629-S OR US-D834861-S OR US-D927102-S OR US-D706344-S OR US-D815832-S OR US-D775524-S).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4644	50	("3472183" | "3820631" | "4488326" | "4741512" | "4995130" | "5113972" | "D346254" | "D375602" | "5588377" | "D378155" | "5833198" | "6651775" | "6814188" | "D640030" | "D640440" | "8015638" | "D771982" | "9615655" | "D814736" | "9961991" | "D825131" | "D827241" | "D830739" | "D832623" | "20120034055" | "20130139736" |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		"20140014886" | "20140027693" | "20150159803" | "20150289641" | "20170049224" | "20170240396" | "20180103752" | "20180177289" | "20180184797" | "20180206630" | "20180255919").pn. OR ("D854775").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4645	124	("1318564" | "2937003" | "3295800" | "3826457" | "4221280" | "4449262" | "4549720" | "4558648" | "4577821" | "4702454" | "4741512" | "4753419" | "4843978" | "D302893" | "4941641" | "4967672" | "4995130" | "5037163" | "5211367" | "5251864" | "5257767" | "5294087" | "5400720" | "5588377" | "5626323" | "5765797" | "5829948" | "5926876" | "5957426" | "6076785" | "6098961" | "6269753" | "6516478" | "6533229" | "6533479" | "6672430" | "6701853" | "6702372" | "6722618" | "6742768" | "6792876" | "7048236" | "7204193" | "7207629" | "7575205" | "7677518" | "7841570" | "7845665" | "7950338" | "8015638" | "8132518" | "8303062" | "8469152" | "8490933" | "8544391" | "8671853" | "8684339" | "8931750" | "8950343" | "9049923" | "9055810" | "9232855" | "9326598" | "9480332" | "9504316" | "9554644" | "9681746" | "9809136" | "9815672" | "9955780" | "9981571" | "9993068" | "10018298" | "10023355" | "D830739" | "10123613" | "D845037" | "10244861" | "10258148" | "10258149" | "10306977" | "D854775" | "10413055" |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		"10499730" | "10517390" | "10524565" | "10542817" | "10544019" | "10568416" | "10575630" | "D901959" | "10869549" | "10893748" | "20030213415" | "20050120922" | "20070080564" | "20070266912" | "20080000393" | "20090145336" | "20100242174" | "20110001033" | "20120097822" | "20120188302" | "20130193392" | "20140144352" | "20150216296" | "20150289641" | "20160338486" | "20160353880" | "20170071332" | "20170174486" | "20170196351" | "20170354245" | "20180055214" | "20180177289" | "20200029685" | "20200107633").pn. OR ("11134774").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4646	29	("20100198374"|"6062148"|"20140137773"|"20120174833"|"7789025"|"20160127809"|"5884882"|"7077068"|"20080255794"|"20140247155"|"9082239"|"20080255794"|"6595144"|"6831829"|"7780578"|"8947215"|"20130204438"|"6546880"|"7517029"|"20130116092"|"20140096706"|"8485945"|"20140247146"|"5323695"|"8587439"|"8690578"|"20140137773"|"20160128467"|"20130321346"|"20140096706"|"20140247154"|"20160260019").PN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4647	27	("10244861"|"20180213929"|"9326598"|"96817	(US-PGPUB; USPAT; USOCR; JPO)	OR	ON	ON	2022/09/21 01:52 PM

		46"|"8931750"|"7246784"|"10114352"|"5957426"|"5722513"|"4640488"|"5251864"|"4448386"|"4702454"|"2843418"|"9668572"|"20070001077"|"4753419"|"11083282"|"20170196351"|"D854775"|"20160249737"|"20120188302"|"10575630").PN.					
L4648	25	("3219338" | "4558648" | "4741512" | "5400720" | "5695173" | "5823120" | "6672430" | "9326598" | "9504316" | "9815672" | "20030154890" | "20050120922" | "20130341984" | "20170174486" | "20170340104").pn. OR ("10258149").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4649	76	("226053" | "4403680" | "4515086" | "4926760" | "5632209" | "5829948" | "6038986" | "6112858" | "6286812" | "6397763" | "6585214" | "6679479" | "6705238" | "6857493" | "7677518" | "7950338" | "8015638" | "8424883" | "8469152" | "9055810" | "9133976" | "20040040480" | "20070034125" | "20130145972" | "20150289641").pn. OR ("9504316").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4650	406	wilkens.xp. AND bracket AND A47B	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4651	159	wilkens.xp. AND stack$4 AND A47B	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT;	OR	ON	ON	2022/09/21 01:52 PM

			IBM_TDB)				
L4652	298	wilkens.xp. AND A47B88/$	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4653	16	("1680081" | "1686783" | "1902795" | "1994424" | "3094363" | "3275396" | "3298768" | "4285560").pn. OR ("10888157").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4654	43	"3275396"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4655	60	("2001744" | "2070960" | "2610824" | "3032319" | "3110476" | "3174722" | "3282566" | "3379411" | "3982718" | "4221280" | "4403680" | "4526346" | "4682750" | "4688760" | "4690250" | "4754713" | "4764075" | "4858888" | "4890692" | "4899987" | "4921074" | "5192053" | "5299906" | "5322143" | "5460460" | "5829948" | "6182796" | "6464205" | "6601826" | "6672430" | "6814188" | "7213686" | "20060126966" | "20060279728" | "20070017748" | "20070235266").pn. OR ("8469152").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4656	37	("4061237" | "4249749" | "4288195" | "4504041" | "4613272" | "4979592" | "5018931" | "6394419" | "6431319" | "6679479" | "8015638" | "8469152" | "8888070" | "9422141" | "9463966" | "9540220"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		| "20030075657" | "20050042068" | "20110262261" | "20140014886" | "20140027693" | "20150028787" | "20150298949").pn. OR ("9815672").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4657	56	("1453406" | "1581874" | "2013542" | "2563060" | "2928558" | "3094948" | "3203670" | "3282566" | "4531720" | "4577821" | "4685731" | "4705438" | "4723769" | "4760997" | "4767109" | "4796029").pn. OR ("5400720").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4658	47	"5861051"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4659	1	"58-61051"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4660	38	"102013008020"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4661	870	A47B1/03.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4662	17703	A47B21/0314,00,02,03.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP,	OR	ON	ON	2022/09/21 01:52 PM

			AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L4663	1350	A47B21/0314,00,02,03.cpc. AND ((pnuematic OR gas) ADJ spring OR actuator)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4664	162	("3140894"|"4926760"|"5588377"|"7640869"|"9113703"|"9615655"|"20160120300"|"6974185"|"9161616"|"5649493"|"8544391"|"9055810"|"9480332"|"9554644"|"20160249737"|"2531856"|"3494662"|"8016305"|"9644378"|"9681746"|"2922685"|"9326598"|"9625929"|"3161161"|"8936306").PN.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4665	88	("2156148"|"20040040480"|"20080203865"|"20130139736"|"20140041554"|"20150216296"|"20150289641"|"20160286951"|"20160338486"|"3245366"|"4691888"|"5588377"|"8544391"|"9326598"|"9480332"|"9504316").PN.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4666	1313	312/208.1,223.3.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4667	0	248/421,562,588,"585,431,432,439".cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4668	0	248/421,562,588,585,431,432,439.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD,	OR	ON	ON	2022/09/21 01:52 PM

			DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L4669	3921	248/421,562,588,585,431,432,439.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4670	2881	248/421,562,588,585.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4671	1060	248/431,432,439.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4672	3035	108/147,144.11,145,93.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4673	1049	108/96,116.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4674	3238	108/118,120,43,138,50.01,50.02.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4675	1877	108/118,120,43,138.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD,	OR	ON	ON	2022/09/21 01:52 PM

			DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L4676	1396	108/50.01,50.02.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4677	550	("7841570"|"8684339"|"5037163"|"10258148"|"8469152"|"9815672"|"10869549"|"10893748"|"20170071332"|"4843978"|"9681746"|"9809136"|"D830739"|"D854775"|"D901959"|"8671853"|"9504316"|"20040040480"|"20050120922"|"20180055214"|"6672430"|"8015638"|"9681746"|"10258148"|"10306977"|"1318564"|"20030213415"|"20050120922"|"20080000393"|"20170354245"|"20200107633"|"4558648"|"4702454"|"5829948"|"6701853"|"8015638"|"D302893"|"10244861"|"7575205"|"10542817"|"20160353880"|"5211367"|"10893748"|"4995130"|"9504316"|"D830739"|"10544019"|"10575630"|"4221280"|"4449262"|"4549720"|"5251864"|"6269753"|"6516478"|"6792876"|"7207629"|"10524565"|"4753419"|"4941641"|"8303062"|"8544391"|"9480332"|"9554644"|"20160309889"|"5257767"|"20150289641"|"20180103752"|"10023355"|"20070080564"|"20150289641"|"2937003"|"4995130"|"5400720"|"5626323"|"5926876"|"6533229"|"6702372"|"6722618"|"6742768"|"9055810"|"7845665"|"4967672"|"20100242174"|"9049923"|"104130	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM

		55"|"20070266912"|"20200029685"|"3295800"|"4741512"|"5294087"|"5957426"|"7048236"|"8490933"|"8950343"|"9232855"|"9993068"|"9326598"|"D854775"|"10123613"|"10258149"|"20140144352"|"20150216296"|"6076785"|"6098961"|"9815672"|"9955780"|"20180177289"|"7677518"|"8931750"|"10499730"|"20160051042"|"6076785"|"4741512"|"20090145336"|"20160338486"|"7204193"|"7950338"|"8132518"|"20070001077"|"5400720"|"D302893"|"10517390"|"10568416"|"20120097822"|"20130193392"|"20170196351"|"3826457"|"4577821"|"5588377"|"5765797"|"6533479"|"6672430"|"8469152"|"10018298"|"9981571").PN.				
L4678	25	("3282566" | "4273306" | "5400720" | "5632209" | "5649493" | "9326598" | "20130340655" | "20140360414" | "20150289641" | "20180055214").pn. OR ("10517390").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4679	56	("1453406" | "1581874" | "2013542" | "2563060" | "2928558" | "3094948" | "3203670" | "3282566" | "4531720" | "4577821" | "4685731" | "4705438" | "4723769" | "4760997" | "4767109" | "4796029").pn. OR ("5400720").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4680	25	("3219338" | "4558648" | "4741512" | "5400720" | "5695173" | "5823120" | "6672430" | "9326598" | "9504316" | "9815672" | "20030154890" | "20050120922" | "20130341984" |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		"20170174486" | "20170340104").pn. OR ("10258149").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4681	76	("226053" | "4403680" | "4515086" | "4926760" | "5632209" | "5829948" | "6038986" | "6112858" | "6286812" | "6397763" | "6585214" | "6679479" | "6705238" | "6857493" | "7677518" | "7950338" | "8015638" | "8424883" | "8469152" | "9055810" | "9133976" | "20040040480" | "20070034125" | "20130145972" | "20150289641").pn. OR ("9504316").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4682	56	("D166377" | "D280478" | "D304112" | "D352845" | "D371687" | "D395969" | "D415910" | "D424828" | "D435368" | "D435986" | "D436268" | "D464212" | "D530939" | "D612643" | "D644046" | "D671338" | "D681979" | "D694044" | "D716074" | "D733476" | "D734413" | "D771981" | "D771982" | "9504316" | "D781617" | "D781618" | "D781619" | "D784050" | "20080178779" | "20130139736" | "20150096472" | "20160106205" | "20160278515" | "20170105518" | "20170196351" | "20170290413" | "20170354245").pn. OR ("D830739").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4683	50	("3472183" | "3820631" | "4488326" | "4741512" | "4995130" | "5113972" | "D346254" |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		"D375602" | "5588377" | "D378155" | "5833198" | "6651775" | "6814188" | "D640030" | "D640440" | "8015638" | "D771982" | "9615655" | "D814736" | "9961991" | "D825131" | "D827241" | "D830739" | "D832623" | "20120034055" | "20130139736" | "20140014886" | "20140027693" | "20150159803" | "20150289641" | "20170049224" | "20170240396" | "20180103752" | "20180177289" | "20180184797" | "20180206630" | "20180255919").pn. OR ("D854775").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4684	2518	A47B9/16.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4685	2081	A47B2021/0321,0364.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4686	10819	(A47B3/00 OR A47B61/00).cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4687	182	(A47B3/00 OR A47B61/00).cpc. AND ((pnuematic OR gas) ADJ spring OR actuator)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM

L4688	3649	A47B3/02,0809,0815.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4689	1712	A47B3/0809,0815.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4690	513	(A47B3/02 AND A47B2003/025).cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4691	1267876	(desk$4 OR table$4) AND ((pnuematic OR gas) ADJ spring OR actuator)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4692	5666298	(desk$4 OR table$4) AND (X OR cross) ADJ (member OR arm)((pnuematic OR gas) ADJ spring OR actuator)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4693	3703	(desk$4 OR table$4) AND (X OR cross) ADJ (member OR arm) SAME ((pnuematic OR gas) ADJ spring OR actuator)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4694	869	(desk$4 OR table$4) SAME (X OR cross) ADJ (member OR arm) SAME ((pnuematic OR gas) ADJ spring OR actuator)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM

L4695	91	(desk$4 OR table$4) SAME (X OR cross) ADJ (member OR arm) SAME ((pnuematic OR gas) ADJ (spring OR actuator))	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4696	305	(desk$4 OR table$4) AND (X OR cross) ADJ (member OR arm) SAME ((pnuematic OR gas) ADJ (spring OR actuator))	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4697	56	"9815672"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4698	202	("7841570"|"8684339"|"5037163"|"10258148"|"8469152"|"9815672"|"10869549"|"10893748"|"20170071332"|"4843978"|"9681746"|"9809136"|"D830739"|"D854775"|"D901959"|"8671853"|"9504316"|"20040040480"|"20050120922"|"20180055214"|"6672430"|"8015638"|"9681746"|"10258148"|"10306977"|"1318564"|"20030213415"|"20050120922"|"20080000393"|"20170354245"|"20200107633"|"4558648"|"4702454"|"5829948"|"6701853"|"8015638"|"D302893"|"10244861"|"7575205"|"10542817"|"20160353880"|"5211367"|"10893748"|"4995130"|"9504316"|"D830739"|"10544019"|"10575630"|"4221280"|"4449262"|"4549720"|"5251864"|"6269753"|"6516478"|"6792876"|"7207629"|"10524565"|"4753419"|"4941641"|"8303062"|"8544391"|"9480332"|"9554644"|"2016030988	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO))	OR	ON	ON	2022/09/21 01:52 PM

		9"|"5257767"|"2015028 9641"|"20180103752"|" 10023355"|"200700805 64"|"20150289641"|"29 37003"|"4995130"|"540 0720"|"5626323"|"5926 876"|"6533229"|"67023 72"|"6722618"|"674276 8"|"9055810"|"7845665" |"4967672"|"201002421 74"|"9049923"|"104130 55"|"20070266912"|"20 200029685"|"3295800"| "4741512"|"5294087"|"5 957426"|"7048236"|"84 90933"|"8950343"|"923 2855"|"9993068"|"9326 598"|"D854775"|"10123 613"|"10258149"|"2014 0144352"|"2015021629 6"|"6076785"|"6098961" |"9815672"|"9955780"|" 20180177289"|"767751 8"|"8931750"|"1049973 0"|"20160051042"|"607 6785"|"4741512"|"2009 0145336"|"2016033848 6"|"7204193"|"7950338" |"8132518"|"200700010 77"|"5400720"|"D30289 3"|"10517390"|"105684 16"|"20120097822"|"20 130193392"|"20170196 351"|"3826457"|"45778 21"|"5588377"|"576579 7"|"6533479"|"6672430" |"8469152"|"10018298"| "9981571").PN.					
L4699	67	"5400720"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4700	84	"4577821"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4701	24	(Artificial Intelligence) More like doc: US-D854775-S	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY,	OR	ON	ON	2022/09/21 01:52 PM

		Text: (WO-0068597-A1 OR DE-4336662-A1 OR US-5694864-A OR AT-149474-T OR US-D378155-S OR US-D375602-S OR US-D346254-S OR US-D825131-S OR US-D814736-S OR US-D640440-S OR US-D837970-S OR TW-201522199-A OR TW-I531523-B OR US-20100012909-A1 OR US-D794629-S OR US-D834861-S OR US-D927102-S OR US-D706344-S OR US-D815832-S OR US-D775524-S).did.	CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L4702	50	("3472183" | "3820631" | "4488326" | "4741512" | "4995130" | "5113972" | "D346254" | "D375602" | "5588377" | "D378155" | "5833198" | "6651775" | "6814188" | "D640030" | "D640440" | "8015638" | "D771982" | "9615655" | "D814736" | "9961991" | "D825131" | "D827241" | "D830739" | "D832623" | "20120034055" | "20130139736" | "20140014886" | "20140027693" | "20150159803" | "20150289641" | "20170049224" | "20170240396" | "20180103752" | "20180177289" | "20180184797" | "20180206630" | "20180255919").pn. OR ("D854775").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4703	124	("1318564" | "2937003" | "3295800" | "3826457" | "4221280" | "4449262" | "4549720" | "4558648" | "4577821" | "4702454" | "4741512" | "4753419" | "4843978" | "D302893"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		| "4941641" | "4967672" | "4995130" | "5037163" | "5211367" | "5251864" | "5257767" | "5294087" | "5400720" | "5588377" | "5626323" | "5765797" | "5829948" | "5926876" | "5957426" | "6076785" | "6098961" | "6269753" | "6516478" | "6533229" | "6533479" | "6672430" | "6701853" | "6702372" | "6722618" | "6742768" | "6792876" | "7048236" | "7204193" | "7207629" | "7575205" | "7677518" | "7841570" | "7845665" | "7950338" | "8015638" | "8132518" | "8303062" | "8469152" | "8490933" | "8544391" | "8671853" | "8684339" | "8931750" | "8950343" | "9049923" | "9055810" | "9232855" | "9326598" | "9480332" | "9504316" | "9554644" | "9681746" | "9809136" | "9815672" | "9955780" | "9981571" | "9993068" | "10018298" | "10023355" | "D830739" | "10123613" | "D845037" | "10244861" | "10258148" | "10258149" | "10306977" | "D854775" | "10413055" | "10499730" | "10517390" | "10524565" | "10542817" | "10544019" | "10568416" | "10575630" | "D901959" | "10869549" | "10893748" | "20030213415" | "20050120922" | "20070080564" | "20070266912" | "20080000393" | "20090145336" | "20100242174" | "20110001033" | "20120097822" | "20120188302" | "20130193392" | "20140144352" |					

		"20150216296" | "20150289641" | "20160338486" | "20160353880" | "20170071332" | "20170174486" | "20170196351" | "20170354245" | "20180055214" | "20180177289" | "20200029685" | "20200107633").pn. OR ("11134774").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4704	29	("20100198374"|"6062148"|"20140137773"|"20120174833"|"7789025"|"20160127809"|"5884882"|"7077068"|"20080255794"|"20140247155"|"9082239"|"20080255794"|"6595144"|"6831829"|"7780578"|"8947215"|"20130204438"|"6546880"|"7517029"|"20130116092"|"20140096706"|"8485945"|"20140247146"|"5323695"|"8587439"|"8690578"|"20140137773"|"20160128467"|"20130321346"|"20140096706"|"20140247154"|"20160260019").PN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4705	27	("10244861"|"20180213929"|"9326598"|"9681746"|"8931750"|"7246784"|"10114352"|"5957426"|"5722513"|"4640488"|"5251864"|"4448386"|"4702454"|"2843418"|"9668572"|"20070001077"|"4753419"|"11083282"|"20170196351"|"D854775"|"20160249737"|"20120188302"|"10575630").PN.	(US-PGPUB; USPAT; USOCR; JPO)	OR	ON	ON	2022/09/21 01:52 PM
L4706	25	("3219338" | "4558648" | "4741512" | "5400720" | "5695173" | "5823120" | "6672430" | "9326598" | "9504316" | "9815672" | "20030154890" | "20050120922" | "20130341984" | "20170174486" | "20170340104").pn. OR	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		("10258149").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4707	76	("226053" | "4403680" | "4515086" | "4926760" | "5632209" | "5829948" | "6038986" | "6112858" | "6286812" | "6397763" | "6585214" | "6679479" | "6705238" | "6857493" | "7677518" | "7950338" | "8015638" | "8424883" | "8469152" | "9055810" | "9133976" | "20040040480" | "20070034125" | "20130145972" | "20150289641").pn. OR ("9504316").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4708	406	wilkens.xp. AND bracket AND A47B	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4709	159	wilkens.xp. AND stack$4 AND A47B	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4710	298	wilkens.xp. AND A47B88/$	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4711	16	("1680081" | "1686783" | "1902795" | "1994424" | "3094363" | "3275396" | "3298768" | "4285560").pn. OR ("10888157").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4712	43	"3275396"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD,	OR	ON	ON	2022/09/21 01:52 PM

			DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L4713	60	("2001744" | "2070960" | "2610824" | "3032319" | "3110476" | "3174722" | "3282566" | "3379411" | "3982718" | "4221280" | "4403680" | "4526346" | "4682750" | "4688760" | "4690250" | "4754713" | "4764075" | "4858888" | "4890692" | "4899987" | "4921074" | "5192053" | "5299906" | "5322143" | "5460460" | "5829948" | "6182796" | "6464205" | "6601826" | "6672430" | "6814188" | "7213686" | "20060126966" | "20060279728" | "20070017748" | "20070235266").pn. OR ("8469152").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4714	37	("4061237" | "4249749" | "4288195" | "4504041" | "4613272" | "4979592" | "5018931" | "6394419" | "6431319" | "6679479" | "8015638" | "8469152" | "8888070" | "9422141" | "9463966" | "9540220" | "20030075657" | "20050042068" | "20110262261" | "20140014886" | "20140027693" | "20150028787" | "20150298949").pn. OR ("9815672").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4715	56	("1453406" | "1581874" | "2013542" | "2563060" | "2928558" | "3094948" | "3203670" | "3282566" | "4531720" | "4577821" | "4685731" | "4705438" | "4723769" | "4760997" | "4767109" | "4796029").pn. OR ("5400720").urpn. AND (PGPB | USPT |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		USOC).dbnm.					
L4716	47	"5861051"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4717	1	"58-61051"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4718	38	"102013008020"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4719	5	"20190116976"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4720	10	"20200003258"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4721	2	"20210214986"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4722	41	"4741512"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT;	OR	ON	ON	2022/09/21 01:52 PM

			IBM_TDB)				
L4723	139	"7677518"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4724	870	A47B1/03.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4725	17703	A47B21/0314,00,02,03.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4726	1350	A47B21/0314,00,02,03.cpc. AND ((pnuematic OR gas) ADJ spring OR actuator)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4727	162	("3140894"|"4926760"|"5588377"|"7640869"|"9113703"|"9615655"|"20160120300"|"6974185"|"9161616"|"5649493"|"8544391"|"9055810"|"9480332"|"9554644"|"20160249737"|"2531856"|"3494662"|"8016305"|"9644378"|"9681746"|"2922685"|"9326598"|"9625929"|"3161161"|"8936306").PN.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4728	88	("2156148"|"20040040480"|"20080203865"|"20130139736"|"20140041554"|"20150216296"|"20150289641"|"20160286951"|"20160338486"|"3245366"|"4691888"|"5588377"|"8544391"|"9326598"|"9480332"|"9504316").PN.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM

L4729	1313	312/208.1,223.3.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4730	0	248/421,562,588, "585,431,432,439".cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4731	0	248/421,562,588,585,431,432,439.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4732	3921	248/421,562,588,585,431,432,439.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4733	2881	248/421,562,588,585.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4734	1060	248/431,432,439.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4735	3035	108/147,144.11,145,93.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM

L4736	1049	108/96,116.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4737	3238	108/118,120,43,138,50.01,50.02.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4738	1877	108/118,120,43,138.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4739	1396	108/50.01,50.02.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4740	550	("7841570"|"8684339"|"5037163"|"10258148"|"8469152"|"9815672"|"10869549"|"10893748"|"20170071332"|"4843978"|"9681746"|"9809136"|"D830739"|"D854775"|"D901959"|"8671853"|"9504316"|"20040040480"|"20050120922"|"20180055214"|"6672430"|"8015638"|"9681746"|"10258148"|"10306977"|"1318564"|"20030213415"|"20050120922"|"20080000393"|"20170354245"|"20200107633"|"4558648"|"4702454"|"5829948"|"6701853"|"8015638"|"D302893"|"10244861"|"7575205"|"10542817"|"20160353880"|"5211367"|"10893748"|"4995130"|"9504316"|"D830739"|"10544019"|"105	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM

		75630"|"4221280"|"4449262"|"4549720"|"5251864"|"6269753"|"6516478"|"6792876"|"7207629"|"10524565"|"4753419"|"4941641"|"8303062"|"8544391"|"9480332"|"9554644"|"20160309889"|"5257767"|"20150289641"|"20180103752"|"10023355"|"20070080564"|"20150289641"|"2937003"|"4995130"|"5400720"|"5626323"|"5926876"|"6533229"|"6702372"|"6722618"|"6742768"|"9055810"|"7845665"|"4967672"|"20100242174"|"9049923"|"10413055"|"20070266912"|"20200029685"|"3295800"|"4741512"|"5294087"|"5957426"|"7048236"|"8490933"|"8950343"|"9232855"|"9993068"|"9326598"|"D854775"|"10123613"|"10258149"|"20140144352"|"20150216296"|"6076785"|"6098961"|"9815672"|"9955780"|"20180177289"|"7677518"|"8931750"|"10499730"|"20160051042"|"6076785"|"4741512"|"20090145336"|"20160338486"|"7204193"|"7950338"|"8132518"|"20070001077"|"5400720"|"D302893"|"10517390"|"10568416"|"20120097822"|"20130193392"|"20170196351"|"3826457"|"4577821"|"5588377"|"5765797"|"6533479"|"6672430"|"8469152"|"10018298"|"9981571").PN.					
L4741	25	("3282566" | "4273306" | "5400720" | "5632209" | "5649493" | "9326598" | "20130340655" | "20140360414" | "20150289641" | "20180055214").pn. OR ("10517390").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4742	56	("1453406" | "1581874"	(US-PGPUB; USPAT;	OR	ON	ON	2022/09/21

		| "2013542" | "2563060" | "2928558" | "3094948" | "3203670" | "3282566" | "4531720" | "4577821" | "4685731" | "4705438" | "4723769" | "4760997" | "4767109" | "4796029").pn. OR ("5400720").urpn. AND (PGPB | USPT | USOC).dbnm.	USOCR)				01:52 PM
L4743	25	("3219338" | "4558648" | "4741512" | "5400720" | "5695173" | "5823120" | "6672430" | "9326598" | "9504316" | "9815672" | "20030154890" | "20050120922" | "20130341984" | "20170174486" | "20170340104").pn. OR ("10258149").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4744	76	("226053" | "4403680" | "4515086" | "4926760" | "5632209" | "5829948" | "6038986" | "6112858" | "6286812" | "6397763" | "6585214" | "6679479" | "6705238" | "6857493" | "7677518" | "7950338" | "8015638" | "8424883" | "8469152" | "9055810" | "9133976" | "20040040480" | "20070034125" | "20130145972" | "20150289641").pn. OR ("9504316").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4745	56	("D166377" | "D280478" | "D304112" | "D352845" | "D371687" | "D395969" | "D415910" | "D424828" | "D435368" | "D435986" | "D436268" | "D464212" | "D530939" | "D612643" | "D644046" | "D671338" | "D681979" | "D694044" | "D716074" | "D733476" | "D734413" | "D771981" | "D771982"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		| "9504316" | "D781617" | "D781618" | "D781619" | "D784050" | "20080178779" | "20130139736" | "20150096472" | "20160106205" | "20160278515" | "20170105518" | "20170196351" | "20170290413" | "20170354245").pn. OR ("D830739").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4746	50	("3472183" | "3820631" | "4488326" | "4741512" | "4995130" | "5113972" | "D346254" | "D375602" | "5588377" | "D378155" | "5833198" | "6651775" | "6814188" | "D640030" | "D640440" | "8015638" | "D771982" | "9615655" | "D814736" | "9961991" | "D825131" | "D827241" | "D830739" | "D832623" | "20120034055" | "20130139736" | "20140014886" | "20140027693" | "20150159803" | "20150289641" | "20170049224" | "20170240396" | "20180103752" | "20180177289" | "20180184797" | "20180206630" | "20180255919").pn. OR ("D854775").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4747	2518	A47B9/16.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4748	2081	A47B2021/0321,0364.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU,	OR	ON	ON	2022/09/21 01:52 PM

			SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L4749	10819	(A47B3/00 OR A47B61/00).cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4750	182	(A47B3/00 OR A47B61/00).cpc. AND ((pnuematic OR gas) ADJ spring OR actuator)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4751	3649	A47B3/02,0809,0815.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4752	1712	A47B3/0809,0815.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4753	513	(A47B3/02 AND A47B2003/025).cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4754	1267876	(desk$4 OR table$4) AND ((pnuematic OR gas) ADJ spring OR actuator)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4755	5666298	(desk$4 OR table$4) AND (X OR cross) ADJ (member OR arm)((pnuematic OR gas) ADJ spring OR	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU,	OR	ON	ON	2022/09/21 01:52 PM

		actuator)	SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L4756	3703	(desk$4 OR table$4) AND (X OR cross) ADJ (member OR arm) SAME ((pnuematic OR gas) ADJ spring OR actuator)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4757	869	(desk$4 OR table$4) SAME (X OR cross) ADJ (member OR arm) SAME ((pnuematic OR gas) ADJ spring OR actuator)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4758	91	(desk$4 OR table$4) SAME (X OR cross) ADJ (member OR arm) SAME ((pnuematic OR gas) ADJ (spring OR actuator))	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4759	305	(desk$4 OR table$4) AND (X OR cross) ADJ (member OR arm) SAME ((pnuematic OR gas) ADJ (spring OR actuator))	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4760	56	"9815672"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4761	202	("7841570"|"8684339"|"5037163"|"10258148"|"8469152"|"9815672"|"10869549"|"10893748"|"20170071332"|"4843978"|"9681746"|"9809136"|"D830739"|"D854775"|"D901959"|"8671853"|"9504316"|"20040040480"|"20050120922"|"20180055214"|"6672430"|"8015638"|"9681746"|"10258148"|"10306977"|"1	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO))	OR	ON	ON	2022/09/21 01:52 PM

		318564"|"20030213415 "|"20050120922"|"2008 0000393"|"2017035424 5"|"20200107633"|"455 8648"|"4702454"|"5829 948"|"6701853"|"80156 38"|"D302893"|"102448 61"|"7575205"|"105428 17"|"20160353880"|"52 11367"|"10893748"|"49 95130"|"9504316"|"D83 0739"|"10544019"|"105 75630"|"4221280"|"444 9262"|"4549720"|"5251 864"|"6269753"|"65164 78"|"6792876"|"720762 9"|"10524565"|"475341 9"|"4941641"|"8303062" |"8544391"|"9480332"|" 9554644"|"2016030988 9"|"5257767"|"2015028 9641"|"20180103752"|" 10023355"|"200700805 64"|"20150289641"|"29 37003"|"4995130"|"540 0720"|"5626323"|"5926 876"|"6533229"|"67023 72"|"6722618"|"674276 8"|"9055810"|"7845665" |"4967672"|"201002421 74"|"9049923"|"104130 55"|"20070266912"|"20 200029685"|"3295800"| "4741512"|"5294087"|"5 957426"|"7048236"|"84 90933"|"8950343"|"923 2855"|"9993068"|"9326 598"|"D854775"|"10123 613"|"10258149"|"2014 0144352"|"2015021629 6"|"6076785"|"6098961" |"9815672"|"9955780"|" 20180177289"|"767751 8"|"8931750"|"1049973 0"|"20160051042"|"607 6785"|"4741512"|"2009 0145336"|"2016033848 6"|"7204193"|"7950338" |"8132518"|"200700010 77"|"5400720"|"D30289 3"|"10517390"|"105684 16"|"20120097822"|"20 130193392"|"20170196 351"|"3826457"|"45778 21"|"5588377"|"576579 7"|"6533479"|"6672430" |"8469152"|"10018298"| "9981571").PN.					

L4762	67	"5400720"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4763	84	"4577821"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4764	24	(Artificial Intelligence) More like doc: US-D854775-S Text: (WO-0068597-A1 OR DE-4336662-A1 OR US-5694864-A OR AT-149474-T OR US-D378155-S OR US-D375602-S OR US-D346254-S OR US-D825131-S OR US-D814736-S OR US-D640440-S OR US-D837970-S OR TW-201522199-A OR TW-I531523-B OR US-20100012909-A1 OR US-D794629-S OR US-D834861-S OR US-D927102-S OR US-D706344-S OR US-D815832-S OR US-D775524-S).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4765	50	("3472183" | "3820631" | "4488326" | "4741512" | "4995130" | "5113972" | "D346254" | "D375602" | "5588377" | "D378155" | "5833198" | "6651775" | "6814188" | "D640030" | "D640440" | "8015638" | "D771982" | "9615655" | "D814736" | "9961991" | "D825131" | "D827241" | "D830739" | "D832623" | "20120034055" | "20130139736" | "20140014886" | "20140027693" |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		"20150159803" | "20150289641" | "20170049224" | "20170240396" | "20180103752" | "20180177289" | "20180184797" | "20180206630" | "20180255919").pn. OR ("D854775").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4766	124	("1318564" | "2937003" | "3295800" | "3826457" | "4221280" | "4449262" | "4549720" | "4558648" | "4577821" | "4702454" | "4741512" | "4753419" | "4843978" | "D302893" | "4941641" | "4967672" | "4995130" | "5037163" | "5211367" | "5251864" | "5257767" | "5294087" | "5400720" | "5588377" | "5626323" | "5765797" | "5829948" | "5926876" | "5957426" | "6076785" | "6098961" | "6269753" | "6516478" | "6533229" | "6533479" | "6672430" | "6701853" | "6702372" | "6722618" | "6742768" | "6792876" | "7048236" | "7204193" | "7207629" | "7575205" | "7677518" | "7841570" | "7845665" | "7950338" | "8015638" | "8132518" | "8303062" | "8469152" | "8490933" | "8544391" | "8671853" | "8684339" | "8931750" | "8950343" | "9049923" | "9055810" | "9232855" | "9326598" | "9480332" | "9504316" | "9554644" | "9681746" | "9809136" | "9815672" | "9955780" | "9981571" | "9993068" | "10018298" | "10023355" | "D830739" | "10123613" | "D845037" | "10244861" | "10258148" | "10258149" | "10306977" | "D854775" | "10413055" | "10499730" | "10517390" |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		"10524565" | "10542817" | "10544019" | "10568416" | "10575630" | "D901959" | "10869549" | "10893748" | "20030213415" | "20050120922" | "20070080564" | "20070266912" | "20080000393" | "20090145336" | "20100242174" | "20110001033" | "20120097822" | "20120188302" | "20130193392" | "20140144352" | "20150216296" | "20150289641" | "20160338486" | "20160353880" | "20170071332" | "20170174486" | "20170196351" | "20170354245" | "20180055214" | "20180177289" | "20200029685" | "20200107633").pn. OR ("11134774").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4767	29	("20100198374"|"6062148"|"20140137773"|"20120174833"|"7789025"|"20160127809"|"5884882"|"7077068"|"20080255794"|"20140247155"|"9082239"|"20080255794"|"6595144"|"6831829"|"7780578"|"8947215"|"20130204438"|"6546880"|"7517029"|"20130116092"|"20140096706"|"8485945"|"20140247146"|"5323695"|"8587439"|"8690578"|"20140137773"|"20160128467"|"20130321346"|"20140096706"|"20140247154"|"20160260019").PN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4768	27	("10244861"|"20180213929"|"9326598"|"9681746"|"8931750"|"7246784"|"10114352"|"595742	(US-PGPUB; USPAT; USOCR; JPO)	OR	ON	ON	2022/09/21 01:52 PM

		6"|"5722513"|"4640488"|"5251864"|"4448386"|"4702454"|"2843418"|"9668572"|"20070001077"|"4753419"|"11083282"|"20170196351"|"D854775"|"20160249737"|"20120188302"|"10575630").PN.					
L4769	25	("3219338" | "4558648" | "4741512" | "5400720" | "5695173" | "5823120" | "6672430" | "9326598" | "9504316" | "9815672" | "20030154890" | "20050120922" | "20130341984" | "20170174486" | "20170340104").pn. OR ("10258149").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4770	76	("226053" | "4403680" | "4515086" | "4926760" | "5632209" | "5829948" | "6038986" | "6112858" | "6286812" | "6397763" | "6585214" | "6679479" | "6705238" | "6857493" | "7677518" | "7950338" | "8015638" | "8424883" | "8469152" | "9055810" | "9133976" | "20040040480" | "20070034125" | "20130145972" | "20150289641").pn. OR ("9504316").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4771	406	wilkens.xp. AND bracket AND A47B	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4772	159	wilkens.xp. AND stack$4 AND A47B	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM

L4773	298	wilkens.xp. AND A47B88/$	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4774	16	("1680081" | "1686783" | "1902795" | "1994424" | "3094363" | "3275396" | "3298768" | "4285560").pn. OR ("10888157").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4775	43	"3275396"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4776	60	("2001744" | "2070960" | "2610824" | "3032319" | "3110476" | "3174722" | "3282566" | "3379411" | "3982718" | "4221280" | "4403680" | "4526346" | "4682750" | "4688760" | "4690250" | "4754713" | "4764075" | "4858888" | "4890692" | "4899987" | "4921074" | "5192053" | "5299906" | "5322143" | "5460460" | "5829948" | "6182796" | "6464205" | "6601826" | "6672430" | "6814188" | "7213686" | "20060126966" | "20060279728" | "20070017748" | "20070235266").pn. OR ("8469152").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4777	37	("4061237" | "4249749" | "4288195" | "4504041" | "4613272" | "4979592" | "5018931" | "6394419" | "6431319" | "6679479" | "8015638" | "8469152" | "8888070" | "9422141" | "9463966" | "9540220" | "20030075657" | "20050042068" |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		"20110262261" | "20140014886" | "20140027693" | "20150028787" | "20150298949").pn. OR ("9815672").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4778	56	("1453406" | "1581874" | "2013542" | "2563060" | "2928558" | "3094948" | "3203670" | "3282566" | "4531720" | "4577821" | "4685731" | "4705438" | "4723769" | "4760997" | "4767109" | "4796029").pn. OR ("5400720").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4779	47	"5861051"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4780	1	"58-61051"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4781	38	"102013008020"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4782	870	A47B1/03.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4783	17703	A47B21/0314,00,02,03.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR,	OR	ON	ON	2022/09/21 01:52 PM

			GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L4784	1350	A47B21/0314,00,02,03.cpc. AND ((pnuematic OR gas) ADJ spring OR actuator)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4785	162	("3140894"|"4926760"|"5588377"|"7640869"|"9113703"|"9615655"|"20160120300"|"6974185"|"9161616"|"5649493"|"8544391"|"9055810"|"9480332"|"9554644"|"20160249737"|"2531856"|"3494662"|"8016305"|"9644378"|"9681746"|"2922685"|"9326598"|"9625929"|"3161161"|"8936306").PN.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4786	88	("2156148"|"20040040480"|"20080203865"|"20130139736"|"20140041554"|"20150216296"|"20150289641"|"20160286951"|"20160338486"|"3245366"|"4691888"|"5588377"|"8544391"|"9326598"|"9480332"|"9504316").PN.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4787	1313	312/208.1,223.3.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4788	0	248/421,562,588, "585,431,432,439".cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4789	0	248/421,562,588,585,431,432,439.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU,	OR	ON	ON	2022/09/21 01:52 PM

			SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L4790	3921	248/421,562,588,585,431,432,439.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4791	2881	248/421,562,588,585.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4792	1060	248/431,432,439.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4793	3035	108/147,144.11,145,93.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4794	1049	108/96,116.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4795	3238	108/118,120,43,138,50.01,50.02.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4796	1877	108/118,120,43,138.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU,	OR	ON	ON	2022/09/21 01:52 PM

			SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L4797	1396	108/50.01,50.02.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4798	550	("7841570"|"8684339"|"5037163"|"10258148"|"8469152"|"9815672"|"10869549"|"10893748"|"20170071332"|"4843978"|"9681746"|"9809136"|"D830739"|"D854775"|"D901959"|"8671853"|"9504316"|"20040040480"|"20050120922"|"20180055214"|"6672430"|"8015638"|"9681746"|"10258148"|"10306977"|"1318564"|"20030213415"|"20050120922"|"20080000393"|"20170354245"|"20200107633"|"4558648"|"4702454"|"5829948"|"6701853"|"8015638"|"D302893"|"10244861"|"7575205"|"10542817"|"20160353880"|"5211367"|"10893748"|"4995130"|"9504316"|"D830739"|"10544019"|"10575630"|"4221280"|"4449262"|"4549720"|"5251864"|"6269753"|"6516478"|"6792876"|"7207629"|"10524565"|"4753419"|"4941641"|"8303062"|"8544391"|"9480332"|"9554644"|"20160309889"|"5257767"|"20150289641"|"20180103752"|"10023355"|"20070080564"|"20150289641"|"2937003"|"4995130"|"5400720"|"5626323"|"5926876"|"6533229"|"6702372"|"6722618"|"6742768"|"9055810"|"7845665"|"4967672"|"20100242174"|"9049923"|"10413055"|"20070266912"|"20200029685"|"3295800"|	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM

		"4741512"|"5294087"|"5957426"|"7048236"|"8490933"|"8950343"|"9232855"|"9993068"|"9326598"|"D854775"|"10123613"|"10258149"|"20140144352"|"20150216296"|"6076785"|"6098961"|"9815672"|"9955780"|"20180177289"|"7677518"|"8931750"|"10499730"|"20160051042"|"6076785"|"4741512"|"20090145336"|"20160338486"|"7204193"|"7950338"|"8132518"|"20070001077"|"5400720"|"D302893"|"10517390"|"10568416"|"20120097822"|"20130193392"|"20170196351"|"3826457"|"4577821"|"5588377"|"5765797"|"6533479"|"6672430"|"8469152"|"10018298"|"9981571").PN.				
L4799	25	("3282566" | "4273306" | "5400720" | "5632209" | "5649493" | "9326598" | "20130340655" | "20140360414" | "20150289641" | "20180055214").pn. OR ("10517390").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4800	56	("1453406" | "1581874" | "2013542" | "2563060" | "2928558" | "3094948" | "3203670" | "3282566" | "4531720" | "4577821" | "4685731" | "4705438" | "4723769" | "4760997" | "4767109" | "4796029").pn. OR ("5400720").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4801	25	("3219338" | "4558648" | "4741512" | "5400720" | "5695173" | "5823120" | "6672430" | "9326598" | "9504316" | "9815672" | "20030154890" | "20050120922" | "20130341984" | "20170174486" | "20170340104").pn. OR	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		("10258149").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4802	76	("226053" | "4403680" | "4515086" | "4926760" | "5632209" | "5829948" | "6038986" | "6112858" | "6286812" | "6397763" | "6585214" | "6679479" | "6705238" | "6857493" | "7677518" | "7950338" | "8015638" | "8424883" | "8469152" | "9055810" | "9133976" | "20040040480" | "20070034125" | "20130145972" | "20150289641").pn. OR ("9504316").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4803	56	("D166377" | "D280478" | "D304112" | "D352845" | "D371687" | "D395969" | "D415910" | "D424828" | "D435368" | "D435986" | "D436268" | "D464212" | "D530939" | "D612643" | "D644046" | "D671338" | "D681979" | "D694044" | "D716074" | "D733476" | "D734413" | "D771981" | "D771982" | "9504316" | "D781617" | "D781618" | "D781619" | "D784050" | "20080178779" | "20130139736" | "20150096472" | "20160106205" | "20160278515" | "20170105518" | "20170196351" | "20170290413" | "20170354245").pn. OR ("D830739").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4804	50	("3472183" | "3820631" | "4488326" | "4741512" | "4995130" | "5113972" | "D346254" | "D375602" | "5588377" | "D378155" | "5833198" |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		"6651775" | "6814188" | "D640030" | "D640440" | "8015638" | "D771982" | "9615655" | "D814736" | "9961991" | "D825131" | "D827241" | "D830739" | "D832623" | "20120034055" | "20130139736" | "20140014886" | "20140027693" | "20150159803" | "20150289641" | "20170049224" | "20170240396" | "20180103752" | "20180177289" | "20180184797" | "20180206630" | "20180255919").pn. OR ("D854775").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4805	2518	A47B9/16.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4806	2081	A47B2021/0321,0364.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4807	10819	(A47B3/00 OR A47B61/00).cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4808	182	(A47B3/00 OR A47B61/00).cpc. AND ((pnuematic OR gas) ADJ spring OR actuator)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4809	3649	A47B3/02,0809,0815.cp	(US-PGPUB; USPAT;	OR	ON	ON	2022/09/21

		c.	USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				01:52 PM
L4810	1712	A47B3/0809,0815.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4811	513	(A47B3/02 AND A47B2003/025).cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4812	1267876	(desk$4 OR table$4) AND ((pnuematic OR gas) ADJ spring OR actuator)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4813	5666298	(desk$4 OR table$4) AND (X OR cross) ADJ (member OR arm)((pnuematic OR gas) ADJ spring OR actuator)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4814	3703	(desk$4 OR table$4) AND (X OR cross) ADJ (member OR arm) SAME ((pnuematic OR gas) ADJ spring OR actuator)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4815	869	(desk$4 OR table$4) SAME (X OR cross) ADJ (member OR arm) SAME ((pnuematic OR gas) ADJ spring OR actuator)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4816	91	(desk$4 OR table$4)	(US-PGPUB; USPAT;	OR	ON	ON	2022/09/21

		SAME (X OR cross) ADJ (member OR arm) SAME ((pnuematic OR gas) ADJ (spring OR actuator))	USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				01:52 PM
L4817	305	(desk$4 OR table$4) AND (X OR cross) ADJ (member OR arm) SAME ((pnuematic OR gas) ADJ (spring OR actuator))	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4818	56	"9815672"	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4819	202	("7841570"|"8684339"|"5037163"|"10258148"|"8469152"|"9815672"|"10869549"|"10893748"|"20170071332"|"4843978"|"9681746"|"9809136"|"D830739"|"D854775"|"D901959"|"8671853"|"9504316"|"20040040480"|"20050120922"|"20180055214"|"6672430"|"8015638"|"9681746"|"10258148"|"10306977"|"1318564"|"20030213415"|"20050120922"|"20080000393"|"20170354245"|"20200107633"|"4558648"|"4702454"|"5829948"|"6701853"|"8015638"|"D302893"|"10244861"|"7575205"|"10542817"|"20160353880"|"5211367"|"10893748"|"4995130"|"9504316"|"D830739"|"10544019"|"10575630"|"4221280"|"4449262"|"4549720"|"5251864"|"6269753"|"6516478"|"6792876"|"7207629"|"10524565"|"4753419"|"4941641"|"8303062"|"8544391"|"9480332"|"9554644"|"20160309889"|"5257767"|"2015028	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO))	OR	ON	ON	2022/09/21 01:52 PM

		9641"|"20180103752"|"10023355"|"20070080564"|"20150289641"|"2937003"|"4995130"|"5400720"|"5626323"|"5926876"|"6533229"|"6702372"|"6722618"|"6742768"|"9055810"|"7845665"|"4967672"|"20100242174"|"9049923"|"10413055"|"20070266912"|"20200029685"|"3295800"|"4741512"|"5294087"|"5957426"|"7048236"|"8490933"|"8950343"|"9232855"|"9993068"|"9326598"|"D854775"|"10123613"|"10258149"|"20140144352"|"20150216296"|"6076785"|"6098961"|"9815672"|"9955780"|"20180177289"|"7677518"|"8931750"|"10499730"|"20160051042"|"6076785"|"4741512"|"20090145336"|"20160338486"|"7204193"|"7950338"|"8132518"|"20070001077"|"5400720"|"D302893"|"10517390"|"10568416"|"20120097822"|"20130193392"|"20170196351"|"3826457"|"4577821"|"5588377"|"5765797"|"6533479"|"6672430"|"8469152"|"10018298"|"9981571").PN.				
L4820	67	"5400720"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4821	84	"4577821"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4822	24	(Artificial Intelligence) More like doc: US-D854775-S Text:	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU,	OR	ON	ON	2022/09/21 01:52 PM

		(WO-0068597-A1 OR DE-4336662-A1 OR US-5694864-A OR AT-149474-T OR US-D378155-S OR US-D375602-S OR US-D346254-S OR US-D825131-S OR US-D814736-S OR US-D640440-S OR US-D837970-S OR TW-201522199-A OR TW-I531523-B OR US-20100012909-A1 OR US-D794629-S OR US-D834861-S OR US-D927102-S OR US-D706344-S OR US-D815832-S OR US-D775524-S).did.	CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L4823	50	("3472183" | "3820631" | "4488326" | "4741512" | "4995130" | "5113972" | "D346254" | "D375602" | "5588377" | "D378155" | "5833198" | "6651775" | "6814188" | "D640030" | "D640440" | "8015638" | "D771982" | "9615655" | "D814736" | "9961991" | "D825131" | "D827241" | "D830739" | "D832623" | "20120034055" | "20130139736" | "20140014886" | "20140027693" | "20150159803" | "20150289641" | "20170049224" | "20170240396" | "20180103752" | "20180177289" | "20180184797" | "20180206630" | "20180255919").pn. OR ("D854775").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4824	124	("1318564" | "2937003" | "3295800" | "3826457" | "4221280" | "4449262" | "4549720" | "4558648" | "4577821" | "4702454" | "4741512" | "4753419" | "4843978" | "D302893" | "4941641" | "4967672"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		| "4995130" | "5037163" | "5211367" | "5251864" | "5257767" | "5294087" | "5400720" | "5588377" | "5626323" | "5765797" | "5829948" | "5926876" | "5957426" | "6076785" | "6098961" | "6269753" | "6516478" | "6533229" | "6533479" | "6672430" | "6701853" | "6702372" | "6722618" | "6742768" | "6792876" | "7048236" | "7204193" | "7207629" | "7575205" | "7677518" | "7841570" | "7845665" | "7950338" | "8015638" | "8132518" | "8303062" | "8469152" | "8490933" | "8544391" | "8671853" | "8684339" | "8931750" | "8950343" | "9049923" | "9055810" | "9232855" | "9326598" | "9480332" | "9504316" | "9554644" | "9681746" | "9809136" | "9815672" | "9955780" | "9981571" | "9993068" | "10018298" | "10023355" | "D830739" | "10123613" | "D845037" | "10244861" | "10258148" | "10258149" | "10306977" | "D854775" | "10413055" | "10499730" | "10517390" | "10524565" | "10542817" | "10544019" | "10568416" | "10575630" | "D901959" | "10869549" | "10893748" | "20030213415" | "20050120922" | "20070080564" | "20070266912" | "20080000393" | "20090145336" | "20100242174" | "20110001033" | "20120097822" | "20120188302" | "20130193392" | "20140144352" | "20150216296" |				

		"20150289641" | "20160338486" | "20160353880" | "20170071332" | "20170174486" | "20170196351" | "20170354245" | "20180055214" | "20180177289" | "20200029685" | "20200107633").pn. OR ("11134774").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4825	29	("20100198374"|"6062148"|"20140137773"|"20120174833"|"7789025"|"20160127809"|"5884882"|"7077068"|"20080255794"|"20140247155"|"9082239"|"20080255794"|"6595144"|"6831829"|"7780578"|"8947215"|"20130204438"|"6546880"|"7517029"|"20130116092"|"20140096706"|"8485945"|"20140247146"|"5323695"|"8587439"|"8690578"|"20140137773"|"20160128467"|"20130321346"|"20140096706"|"20140247154"|"20160260019").PN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4826	27	("10244861"|"20180213929"|"9326598"|"9681746"|"8931750"|"7246784"|"10114352"|"5957426"|"5722513"|"4640488"|"5251864"|"4448386"|"4702454"|"2843418"|"9668572"|"20070001077"|"4753419"|"11083282"|"20170196351"|"D854775"|"20160249737"|"20120188302"|"10575630").PN.	(US-PGPUB; USPAT; USOCR; JPO)	OR	ON	ON	2022/09/21 01:52 PM
L4827	25	("3219338" | "4558648" | "4741512" | "5400720" | "5695173" | "5823120" | "6672430" | "9326598" | "9504316" | "9815672" | "20030154890" | "20050120922" | "20130341984" | "20170174486" | "20170340104").pn. OR ("10258149").urpn.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		AND (PGPB | USPT | USOC).dbnm.					
L4828	76	("226053" | "4403680" | "4515086" | "4926760" | "5632209" | "5829948" | "6038986" | "6112858" | "6286812" | "6397763" | "6585214" | "6679479" | "6705238" | "6857493" | "7677518" | "7950338" | "8015638" | "8424883" | "8469152" | "9055810" | "9133976" | "20040040480" | "20070034125" | "20130145972" | "20150289641").pn. OR ("9504316").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4829	406	wilkens.xp. AND bracket AND A47B	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4830	159	wilkens.xp. AND stack$4 AND A47B	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4831	298	wilkens.xp. AND A47B88/$	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4832	16	("1680081" | "1686783" | "1902795" | "1994424" | "3094363" | "3275396" | "3298768" | "4285560").pn. OR ("10888157").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4833	43	"3275396"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR,	OR	ON	ON	2022/09/21 01:52 PM

			GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L4834	60	("2001744" | "2070960" | "2610824" | "3032319" | "3110476" | "3174722" | "3282566" | "3379411" | "3982718" | "4221280" | "4403680" | "4526346" | "4682750" | "4688760" | "4690250" | "4754713" | "4764075" | "4858888" | "4890692" | "4899987" | "4921074" | "5192053" | "5299906" | "5322143" | "5460460" | "5829948" | "6182796" | "6464205" | "6601826" | "6672430" | "6814188" | "7213686" | "20060126966" | "20060279728" | "20070017748" | "20070235266").pn. OR ("8469152").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4835	37	("4061237" | "4249749" | "4288195" | "4504041" | "4613272" | "4979592" | "5018931" | "6394419" | "6431319" | "6679479" | "8015638" | "8469152" | "8888070" | "9422141" | "9463966" | "9540220" | "20030075657" | "20050042068" | "20110262261" | "20140014886" | "20140027693" | "20150028787" | "20150298949").pn. OR ("9815672").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4836	56	("1453406" | "1581874" | "2013542" | "2563060" | "2928558" | "3094948" | "3203670" | "3282566" | "4531720" | "4577821" | "4685731" | "4705438" | "4723769" | "4760997" | "4767109" | "4796029").pn. OR ("5400720").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

L4837	47	"5861051"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4838	1	"58-61051"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4839	38	"102013008020"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4840	5	"20190116976"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4841	10	"20200003258"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4842	2	"20210214986"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4843	41	"4741512"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM

L4844	139	"7677518"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4845	24	("10114352"|"10244861"|"10575630"|"11083282"|"20070001077"|"20120188302"|"20160249737"|"20170196351"|"20180213929"|"2843418"|"4448386"|"4640488"|"4702454"|"4753419"|"5251864"|"5722513"|"5957426"|"7246784"|"8931750"|"9326598"|"9668572"|"9681746"|"D854775").PN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4846	70	("1318564" | "2937003" | "3295800" | "4221280" | "4558648" | "4577821" | "4843978" | "5588377" | "5626323" | "5829948" | "5957426" | "6098961" | "6269753" | "6516478" | "6533479" | "6722618" | "6742768" | "8132518" | "8671853" | "9049923" | "9055810" | "9326598" | "9480332" | "9504316" | "9554644" | "20030213415" | "20040035332" | "20040040480" | "20070080564" | "20080000393" | "20090090832" | "20090200437" | "20110001033" | "20110024958" | "20120097822" | "20130145972" | "20130193392" | "20140144352" | "20150232005" | "20150375896" | "20160338486" | "20170174486" | "20180008037").pn. OR ("10244861").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4847	27	("10114352"|"10244861"|"10575630"|"1108328	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		2"|"11134773"|"20030213415"|"20070001077"|"20120188302"|"20160249737"|"20170196351"|"20180213929"|"2843418"|"4448386"|"4640488"|"4702454"|"4753419"|"5251864"|"5722513"|"5957426"|"7246784"|"8931750"|"9326598"|"9668572"|"9681746"|"9815672"|"D854775").PN.					
L4848	70	("1234569" | "1318564" | "2156148" | "2630359" | "4926760" | "5497706" | "5588377" | "5833200" | "6182935" | "6701853" | "7849789" | "8015638" | "8544391" | "8936306").pn. OR ("9326598").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4849	25	("383610" | "4640488" | "5211369" | "7246784" | "7637468" | "7677518" | "8439334" | "8844894" | "9326598" | "10092089" | "20070295882" | "20130145972" | "20140264215" | "20150014609" | "20160249737" | "20180008037" | "20180146775" | "20180177289" | "20180279770" | "20180332957" | "20180360208" | "20200298599").pn. OR ("11083282").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4850	18	("2016/0249737").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4851	25	("3219338" | "4558648" | "4741512" | "5400720" | "5695173" | "5823120" | "6672430" | "9326598" | "9504316" | "9815672" | "20030154890" | "20050120922" | "20130341984" | "20170174486" | "20170340104").pn. OR ("10258149").urpn.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		AND (PGPB | USPT | USOC).dbnm.					
L4852	76	("226053" | "4403680" | "4515086" | "4926760" | "5632209" | "5829948" | "6038986" | "6112858" | "6286812" | "6397763" | "6585214" | "6679479" | "6705238" | "6857493" | "7677518" | "7950338" | "8015638" | "8424883" | "8469152" | "9055810" | "9133976" | "20040040480" | "20070034125" | "20130145972" | "20150289641").pn. OR ("9504316").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4853	37	("2766088" | "D716074" | "9326598" | "9504316" | "D781617" | "D781618" | "20030230222" | "20150289641" | "20170290413" | "20170354245" | "20180055214" | "20180125227").pn. OR ("D845037").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4854	76	("226053" | "4403680" | "4515086" | "4926760" | "5632209" | "5829948" | "6038986" | "6112858" | "6286812" | "6397763" | "6585214" | "6679479" | "6705238" | "6857493" | "7677518" | "7950338" | "8015638" | "8424883" | "8469152" | "9055810" | "9133976" | "20040040480" | "20070034125" | "20130145972" | "20150289641").pn. OR ("9504316").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4855	56	"9815672"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO;	OR	ON	ON	2022/09/21 01:52 PM

			JPO; DERWENT; IBM_TDB)				
L4856	17	"9815672"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO))	OR	ON	ON	2022/09/21 01:52 PM
L4857	135828	hydraulic WITH gas WITH (spring OR cylinder)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4858	727	hydraulic WITH gas WITH (spring OR cylinder) AND A47B	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4859	263	hydraulic WITH gas WITH (spring OR cylinder) AND A47B AND desk	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4860	139	"7677518"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4861	114	"7677518"	(US-PGPUB; USPAT; USOCR; EPO)	OR	ON	ON	2022/09/21 01:52 PM
L4862	114	"7677518"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4863	129	("4691886" | "4729533" | "5037054" | "5044284" | "5174223" | "5200859" | "5287815" | "5405204" | "5445353" | "5564668" | "5636711" | "D393382" | "5829948" | "5938622" | "5961231" | "6286812" | "6585214" | "6736469" | "6905102" | "7111825" | "7383786").pn. OR	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		("7677518").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4864	10	("6857493"|"5400720").PN.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4865	37	"1142343"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4866	2	("6857493"|"5400720").PN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4867	104	("10114352"|"10244861"|"10575630"|"11083282"|"20070001077"|"20120188302"|"20160249737"|"20170196351"|"20180213929"|"2843418"|"4448386"|"4640488"|"4702454"|"4753419"|"5251864"|"5722513"|"5957426"|"7246784"|"8931750"|"9326598"|"9668572"|"9681746"|"D854775").PN.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4868	24	("10114352"|"10244861"|"10575630"|"11083282"|"20070001077"|"20120188302"|"20160249737"|"20170196351"|"20180213929"|"2843418"|"4448386"|"4640488"|"4702454"|"4753419"|"5251864"|"5722513"|"5957426"|"7246784"|"8931750"|"9326598"|"9668572"|"9681746"|"D854775").PN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4869	132	("10018298" OR "10023355" OR "10123613" OR "10258148" OR "10258149" OR "10264877" OR "10306977" OR "10413055" OR "10499730" OR	(US-PGPUB; USPAT)	OR	ON	ON	2022/09/21 01:52 PM

		"10517390" OR "10524565" OR "10542817" OR "10544019" OR "10568416" OR "10869549" OR "10893748" OR "11134773" OR "11134774" OR "11140977" OR "11147366" OR "11160367" OR "1318564" OR "20030042380" OR "20030213415" OR "20050120922" OR "20070080564" OR "20070266912" OR "20080000393" OR "20090145336" OR "20100242174" OR "20120097822" OR "20130193392" OR "20140144352" OR "20150028787" OR "20150216296" OR "20150289641" OR "20160338486" OR "20160353880" OR "20170071332" OR "20170354245" OR "20180177289" OR "20180279770" OR "20190110588" OR "20190183239" OR "20190269237" OR "20200029685" OR "20200107633" OR "2937003" OR "3295800" OR "3823915" OR "3826457" OR "4221280" OR "4449262" OR "4549720" OR "4558648" OR "4577821" OR "4625657" OR "4659052" OR "4709972" OR "4717112" OR "4741512" OR "4826123" OR "4843978" OR "4941641" OR "4967672" OR "4995130" OR "5037163" OR					

		"5048784" OR "5211367" OR "5257767" OR "5294087" OR "5400720" OR "5588377" OR "5626323" OR "5765797" OR "5829948" OR "5836562" OR "5926876" OR "6076785" OR "6098961" OR "6148739" OR "6176456" OR "6179261" OR "6269753" OR "6273382" OR "6488248" OR "6516478" OR "6533229" OR "6533479" OR "6672430" OR "6701853" OR "6702372" OR "6722618" OR "6742768" OR "6792876" OR "6938866" OR "7048236" OR "7188813" OR "7204193" OR "7207629" OR "7575205" OR "7677518" OR "7841570" OR "7845665" OR "7946551" OR "7950338" OR "8015638" OR "8132518" OR "8303062" OR "8469152" OR "8490933" OR "8544391" OR "8671853" OR "8684339" OR "8950343" OR "9049923" OR "9055810" OR "9232855" OR "9480332" OR "9504316" OR "9554644" OR "9809136" OR "9815672" OR "9854904" OR "9955780" OR					

		"9981571" OR "9993068" OR "D302893" OR "D830739" OR "D845037" OR "D870490" OR "D901959").pn.					
L4870	27	("2531856" | "3727245" | "4611823" | "5447319" | "5722513" | "6974185" | "8016305" | "8544391" | "9326598" | "20040040480").pn. OR ("9480332").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4871	2481	A47B67/005.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4872	2113	(A47B3/00 OR A47B61/00).cpc. AND (gear OR shaft)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4873	48	wilkens.xp. AND lift SAME table	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4874	34	(Artificial Intelligence) More like doc: US-8950343-B2 Text: (US-20140041554-A1 OR TW-M445388-U OR US-10092089-B1 OR JP-2018520740-A OR GB-2341790-A OR DK-179639-B1 OR US-20180160799-A1 OR WO-2016200318-A1 OR EP-3307108-A1 OR CN-107708486-A OR WO-2016200318-A8 OR WO-2018137739-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM

		A1 OR US-9713375-B1 OR DK-201700050-A1 OR US-20180103752-A1 OR US-10258149-B2 OR US-20180255919-A1 OR JP-2017513663-A OR US-10542817-B2 OR US-20150272316-A1).did.					
L4875	132	("20180125227" OR "10018298" OR "10023355" OR "10114352" OR "10123613" OR "10244861" OR "10258149" OR "10264877" OR "10306977" OR "10413055" OR "10524565" OR "10542817" OR "10544019" OR "10568416" OR "10575630" OR "10869549" OR "11083282" OR "11140977" OR "11147366" OR "1318564" OR "20030042380" OR "20030213415" OR "20070001077" OR "20070080564" OR "20070266912" OR "20080000393" OR "20100242174" OR "20120097822" OR "20120188302" OR "20130193392" OR "20150216296" OR "20160338486" OR "20160353880" OR "20170071332" OR "20170196351" OR "20180177289" OR "20180213929" OR "20180279770" OR "20190110588" OR "20190183239" OR "20190269237" OR "20200029685" OR "20200107633" OR "2843418" OR "2937003" OR "3295800" OR "4221280" OR "4448386" OR	(US-PGPUB; USPAT)	OR	ON	ON	2022/09/21 01:52 PM

		"4449262" OR "4549720" OR "4558648" OR "4577821" OR "4625657" OR "4640488" OR "4702454" OR "4709972" OR "4717112" OR "4753419" OR "4826123" OR "4843978" OR "4941641" OR "4967672" OR "4995130" OR "5037163" OR "5048784" OR "5211367" OR "5251864" OR "5257767" OR "5294087" OR "5400720" OR "5588377" OR "5626323" OR "5722513" OR "5765797" OR "5829948" OR "5836562" OR "5926876" OR "5957426" OR "6076785" OR "6098961" OR "6148739" OR "6176456" OR "6179261" OR "6269753" OR "6273382" OR "6488248" OR "6516478" OR "6533229" OR "6533479" OR "6672430" OR "6701853" OR "6702372" OR "6722618" OR "6742768" OR "6792876" OR "6938866" OR "7048236" OR "7188813" OR "7204193" OR "7207629" OR "7246784" OR "7575205" OR "7841570" OR "7845665" OR "7946551" OR "7950338" OR					

		"8015638" OR "8132518" OR "8303062" OR "8469152" OR "8490933" OR "8544391" OR "8671853" OR "8684339" OR "8950343" OR "9049923" OR "9055810" OR "9232855" OR "9326598" OR "9480332" OR "9504316" OR "9554644" OR "9668572" OR "9681746" OR "9809136" OR "9854904" OR "9955780" OR "9981571" OR "9993068" OR "D830739" OR "D870490" OR "D901959").pn.					
L4876	26	("4221280" | "4577821" | "4995130" | "5186038" | "5322143" | "5588377" | "9161616" | "D845037" | "10264877" | "10517390" | "20100012909" | "20140041554" | "20160338486" | "20170354245" | "20180055214" | "20180146775").pn. OR ("10869549").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4877	124	("1318564" | "2937003" | "3295800" | "3826457" | "4221280" | "4449262" | "4549720" | "4558648" | "4577821" | "4702454" | "4741512" | "4753419" | "4843978" | "D302893" | "4941641" | "4967672" | "4995130" | "5037163" | "5211367" | "5251864" | "5257767" | "5294087" | "5400720" | "5588377" | "5626323" | "5765797" | "5829948" | "5926876" | "5957426" | "6076785" | "6098961" | "6269753"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		| "6516478" | "6533229" | "6533479" | "6672430" | "6701853" | "6702372" | "6722618" | "6742768" | "6792876" | "7048236" | "7204193" | "7207629" | "7575205" | "7677518" | "7841570" | "7845665" | "7950338" | "8015638" | "8132518" | "8303062" | "8469152" | "8490933" | "8544391" | "8671853" | "8684339" | "8931750" | "8950343" | "9049923" | "9055810" | "9232855" | "9326598" | "9480332" | "9504316" | "9554644" | "9681746" | "9809136" | "9815672" | "9955780" | "9981571" | "9993068" | "10018298" | "10023355" | "D830739" | "10123613" | "D845037" | "10244861" | "10258148" | "10258149" | "10306977" | "D854775" | "10413055" | "10499730" | "10517390" | "10524565" | "10542817" | "10544019" | "10568416" | "10575630" | "D901959" | "10869549" | "10893748" | "20030213415" | "20050120922" | "20070080564" | "20070266912" | "20080000393" | "20090145336" | "20100242174" | "20110001033" | "20120097822" | "20120188302" | "20130193392" | "20140144352" | "20150216296" | "20150289641" | "20160338486" | "20160353880" | "20170071332" | "20170174486" | "20170196351" | "20170354245" | "20180055214" |					

		"20180177289" | "20200029685" | "20200107633").pn. OR ("11134774").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4878	87	("1318564" | "2937003" | "3295800" | "4221280" | "4558648" | "4577821" | "4843978" | "5037163" | "5211367" | "5257767" | "5588377" | "5626323" | "5829948" | "5957426" | "6076785" | "6098961" | "6269753" | "6516478" | "6533479" | "6701853" | "6722618" | "6742768" | "6792876" | "7677518" | "7841570" | "7950338" | "8132518" | "8544391" | "8671853" | "8684339" | "8931750" | "9049923" | "9326598" | "9480332" | "9504316" | "9554644" | "9681746" | "10159336" | "10244861" | "10258148" | "10258149" | "10499730" | "10542817" | "20030213415" | "20040040480" | "20070080564" | "20080000393" | "20120097822" | "20130193392" | "20130199420" | "20140144352" | "20140158026" | "20150232005" | "20150368082" | "20150375896" | "20160051042" | "20160106205" | "20160170402" | "20160260019" | "20160309889" | "20160338486" | "20160353880" | "20170174486" | "20170360192" | "20180008037" | "20180125227" | "20180177289" | "20180279770" | "20180360208" | "20190110588" |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		"20190269237" | "20200029685").pn. OR ("10893748").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4879	162	("1824822" | "2545515" | "2579577" | "2581023" | "2630359" | "2727799" | "2798641" | "3203373" | "3245366" | "3347184" | "3727245" | "3888451" | "4032103" | "4073240" | "4130069" | "4194452" | "4515086" | "4534544" | "4558847" | "4577821" | "4589621" | "4625657" | "4728118" | "4981052" | "4981085" | "5039054" | "5048784" | "5083512" | "5088676" | "5174223" | "5192053" | "5251864" | "5322025" | "5325794" | "5375514" | "5394809" | "5490466" | "5503086" | "5549052" | "5553550" | "5588377" | "5649493" | "5680820" | "5687655" | "5778799" | "5794911" | "5823120" | "5833198" | "5938340" | "5967059" | "6026755" | "6038986" | "6283047" | "6286441" | "6378446" | "6439657" | "6510803" | "6516478" | "6520091" | "6603157" | "6691626" | "6701853" | "6874431" | "6991199" | "7048236" | "7059254" | "7201108" | "7246784" | "7385376" | "7548051" | "7642759" | "7654208" | "7677518" | "7690317" | "7849789" | "7887014" | "7950338" | "8065966" | "8132518" | "8439319" | "8544391" | "8671853" | "8783639" | "8800454" | "8931750" | "8950343" | "9049923" | "9055810" | "9072645" | "9113703" | "9668572" | "20020189505" | "20030213415" | "20040187742" | "20040227443" | "20050041721" | "20050248239" | "20060037518" |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		"20060038383" | "20060157628" | "20070163475" | "20070259554" | "20070266912" | "20070295882" | "20080308016" | "20090179121" | "20100242174" | "20100257671" | "20110120351" | "20110168062" | "20110247532" | "20130014674" | "20130139736" | "20130145972" | "20130199420" | "20130340655" | "20140020606" | "20140041554" | "20140144352" | "20140158026" | "20140165882" | "20140360411" | "20150164218" | "20150216296" | "20150231992" | "20150250303" | "20150289641" | "20160120300" | "20160198853" | "20160278515" | "20160338486" | "20170354245" | "20170360188" | "20180103752" | "20180146775" | "20180160799" | "20180213929" | "20180279772").pn. OR ("10542817").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4880	87	("1318564" | "2937003" | "3295800" | "4221280" | "4558648" | "4577821" | "4843978" | "5037163" | "5211367" | "5257767" | "5588377" | "5626323" | "5829948" | "5957426" | "6076785" | "6098961" | "6269753" | "6516478" | "6533479" | "6701853" | "6722618" | "6742768" | "6792876" | "7677518" | "7841570" | "7950338" | "8132518" | "8544391" | "8671853" | "8684339"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		| "8931750" | "9049923" | "9326598" | "9480332" | "9504316" | "9554644" | "9681746" | "10159336" | "10244861" | "10258148" | "10258149" | "10499730" | "10542817" | "20030213415" | "20040040480" | "20070080564" | "20080000393" | "20120097822" | "20130193392" | "20130199420" | "20140144352" | "20140158026" | "20150232005" | "20150368082" | "20150375896" | "20160051042" | "20160106205" | "20160170402" | "20160260019" | "20160309889" | "20160338486" | "20160353880" | "20170174486" | "20170360192" | "20180008037" | "20180125227" | "20180177289" | "20180279770" | "20180360208" | "20190110588" | "20190269237" | "20200029685").pn. OR ("10893748").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4881	33	("136357" | "2624535" | "2733109" | "3001559" | "4967672" | "5588377" | "5636711" | "5829948" | "7032872" | "7059616" | "7677518" | "20140144352").pn. OR ("8950343").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4882	8	("2012/0188302").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4883	22	("2005/0120922").urpn. AND (PGPB | USPT |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		USOC).dbnm.					
L4884	132	("20180125227" OR "10018298" OR "10023355" OR "10114352" OR "10123613" OR "10244861" OR "10258149" OR "10264877" OR "10306977" OR "10413055" OR "10524565" OR "10542817" OR "10544019" OR "10568416" OR "10575630" OR "10869549" OR "11083282" OR "11140977" OR "11147366" OR "1318564" OR "20030042380" OR "20030213415" OR "20070001077" OR "20070080564" OR "20070266912" OR "20080000393" OR "20100242174" OR "20120097822" OR "20120188302" OR "20130193392" OR "20150216296" OR "20160338486" OR "20160353880" OR "20170071332" OR "20170196351" OR "20180177289" OR "20180213929" OR "20180279770" OR "20190110588" OR "20190183239" OR "20190269237" OR "20200029685" OR "20200107633" OR "2843418" OR "2937003" OR "3295800" OR "4221280" OR "4448386" OR "4449262" OR "4549720" OR "4558648" OR "4577821" OR "4625657" OR "4640488" OR "4702454" OR "4709972" OR "4717112" OR	(US-PGPUB; USPAT)	OR	ON	ON	2022/09/21 01:52 PM

		"4753419" OR "4826123" OR "4843978" OR "4941641" OR "4967672" OR "4995130" OR "5037163" OR "5048784" OR "5211367" OR "5251864" OR "5257767" OR "5294087" OR "5400720" OR "5588377" OR "5626323" OR "5722513" OR "5765797" OR "5829948" OR "5836562" OR "5926876" OR "5957426" OR "6076785" OR "6098961" OR "6148739" OR "6176456" OR "6179261" OR "6269753" OR "6273382" OR "6488248" OR "6516478" OR "6533229" OR "6533479" OR "6672430" OR "6701853" OR "6702372" OR "6722618" OR "6742768" OR "6792876" OR "6938866" OR "7048236" OR "7188813" OR "7204193" OR "7207629" OR "7246784" OR "7575205" OR "7841570" OR "7845665" OR "7946551" OR "7950338" OR "8015638" OR "8132518" OR "8303062" OR "8469152" OR "8490933" OR "8544391" OR "8671853" OR "8684339" OR "8950343" OR					

		"9049923" OR "9055810" OR "9232855" OR "9326598" OR "9480332" OR "9504316" OR "9554644" OR "9668572" OR "9681746" OR "9809136" OR "9854904" OR "9955780" OR "9981571" OR "9993068" OR "D830739" OR "D870490" OR "D901959").pn.					
L4885	2518	A47B9/16.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4886	6151	A47B21/02.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4887	1892	A47B21/02.cpc. AND (gas OR spring)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4888	390	A47B2200/005.cpc. AND (gas OR spring)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4889	49	(Artificial Intelligence) More like doc: CN-106473451-A Text: (CN-206565534-U OR CN-106473451-B OR CN-204580324-U OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS,	OR	ON	ON	2022/09/21 01:52 PM

		CN-105342138-B OR CN-105342138-A OR CN-108024625-A OR CN-106165968-B OR US-20180255919-A1 OR CA-2999757-C OR US-10542817-B2 OR CN-108024625-B OR CN-106617668-A OR US-11395544-B1 OR WO-2018072235-A1 OR AT-413318-B OR CN-203353949-U OR CN-102949016-A OR EP-0142919-A1 OR CN-204541230-U OR CN-106165968-A).did.	IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L4890	2404	A47B9/10.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4891	387	108/144.11,147.22.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4892	1960	A47B3/02.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4893	1955	(A47B3/00 OR A47B61/00).cpc. AND (gas OR pneumatic OR spring)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4894	591	A47B2003/025.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT;	OR	ON	ON	2022/09/21 01:52 PM

			IBM_TDB)				
L4895	2630	108/116-118,120,43,138.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4896	36	("4052944" | "4765583" | "5125606" | "5131614" | "5143341" | "5263423" | "5355811" | "5593128" | "5732928").pn. OR ("5893540").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4897	48	(Artificial Intelligence) More like doc: KR-20110006306-U Text: (KR-200416871-Y1 OR KR-20140006320-U OR CN-108813920-A OR TW-201033508-A OR KR-20160002687-U OR CN-110934419-A OR US-20100237666-A1 OR WO-2021226487-A1 OR US-20210345768-A1 OR CN-113812797-A OR CN-110623417-A OR CN-110786639-A OR CN-106165968-B OR AU-2014283918-A1 OR IE-S84540-Y1 OR CN-110115422-A OR GB-2439522-A OR WO-2008028306-A3 OR CN-2473993-Y OR CN-110973828-A).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4898	1700	248/421,562,588,585,431,432,439.ccls. AND (gas OR pneumatic OR spring)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4899	948	108/147,145,93,96.ccls. AND (gas OR pneumatic OR spring)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO;	OR	ON	ON	2022/09/21 01:52 PM

			JPO; DERWENT; IBM_TDB)				
L4900	39	(Artificial Intelligence) More like doc: US-10568416-B1 Text: (US-10244861-B1 OR US-11147366-B1 OR US-10575630-B1 OR US-11140977-B1 OR US-11134773-B1 OR US-11160367-B1 OR US-11388989-B1 OR US-11134774-B1 OR US-10893748-B1 OR US-11388991-B1 OR US-11395544-B1 OR US-9504316-B1 OR WO-2017184206-A1 OR US-20130014674-A1 OR US-20160037909-A1 OR US-20180103752-A1 OR US-10258149-B2 OR EP-3593671-B1 OR US-20140238279-A1 OR US-9681746-B1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4901	14	"201230022"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4902	0	"JP201230022"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4903	0	"JP2012030022"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4904	76	fin ADJ reinforcement SAME (tube OR column OR cylinder)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR,	OR	ON	ON	2022/09/21 01:52 PM

			GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L4905	61	triangle ADJ reinforcement SAME (tube OR column OR cylinder)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4906	16	("20160338486"|"11134773"|"11109671"|"10542817"|"20140041554"). PN.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4907	2404	A47B9/10.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4908	49	"6857493"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4909	18	"2018125227"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4910	9	"20180125227"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4911	161	("10258148"|"20160249737"|"9815672"|"4448386"|"9681746"|"108695	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		49"|"20170071332"|"48 43978"|"5037163"|"617 9261"|"7841570"|"8684 339"|"9809136"|"D8307 39"|"D901959"|"104997 30"|"20050120922"|"20 090145336"|"4659052"| "20030213415"|"47024 54"|"10258149"|"13185 64"|"20080000393"|"20 100242174"|"20200029 685"|"20200107633"|"4 558648"|"5829948"|"67 01853"|"7946551"|"801 5638"|"8671853"|"9504 316"|"11134773"|"1024 4861"|"10575630"|"111 40977"|"11147366"|"52 51864"|"10123613"|"10 542817"|"10544019"|"2 0160353880"|"4221280 "|"4449262"|"4549720"|" 4717112"|"5211367"|"6 076785"|"6176456"|"62 69753"|"6516478"|"679 2876"|"7207629"|"7575 205"|"9854904"|"20140 144352"|"20150289641 "|"7677518"|"D845037"| "20070001077"|"20180 213929"|"4640488"|"47 53419"|"9668572"|"100 23355"|"10264877"|"10 524565"|"20070080564 "|"2937003"|"4941641"|" 4967672"|"4995130"|"5 257767"|"5400720"|"56 26323"|"5926876"|"653 3229"|"6702372"|"6722 618"|"6742768"|"78456 65"|"8303062"|"854439 1"|"9055810"|"9480332" |"9554644"|"9993068"|" 11160367"|"201500287 87"|"3823915"|"382645 7"|"11083282"|"284341 8"|"5957426"|"1041305 5"|"20070266912"|"201 80279770"|"201902692 37"|"3295800"|"529408 7"|"6938866"|"7048236" |"8132518"|"8490933"|" 8950343"|"9049923"|"9 232855"|"11134774"|"D 854775"|"9326598"|"20 150216296"|"20190110 588"|"20190183239"|"4 709972"|"5048784"|"60					

		98961"|"6148739"|"7188813"|"9955780"|"20180125227"|"10893748"|"4741512"|"8931750"|"6857493"|"10114352"|"5722513"|"20030042380"|"20160338486"|"20180177289"|"4625657"|"4826123"|"6273382"|"7204193"|"D870490"|"10517390"|"20170354245"|"D302893"|"5400720"|"10568416"|"20120188302"|"20170196351"|"7246784"|"10018298"|"10306977"|"20120097822"|"20130193392"|"4577821"|"5588377"|"5765797"|"5836562"|"6488248"|"6533479"|"6672430"|"7950338"|"8469152"|"9981571").PN.					
L4912	70	("1318564" | "2937003" | "3295800" | "4221280" | "4558648" | "4577821" | "4843978" | "5588377" | "5626323" | "5829948" | "5957426" | "6098961" | "6269753" | "6516478" | "6533479" | "6722618" | "6742768" | "8132518" | "8671853" | "9049923" | "9055810" | "9326598" | "9480332" | "9504316" | "9554644" | "20030213415" | "20040035332" | "20040040480" | "20070080564" | "20080000393" | "20090090832" | "20090200437" | "20110001033" | "20110024958" | "20120097822" | "20130145972" | "20130193392" | "20140144352" | "20150232005" | "20150375896" | "20160338486" | "20170174486" | "20180008037").pn. OR ("10244861").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4913	39	(Artificial Intelligence)	(US-PGPUB; USPAT;	OR	ON	ON	2022/09/21

		More like doc: US-10244861-B1 Text: (US-10568416-B1 OR US-11147366-B1 OR US-10575630-B1 OR US-11388989-B1 OR US-11140977-B1 OR US-11134773-B1 OR US-11160367-B1 OR US-11134774-B1 OR US-10893748-B1 OR US-11388991-B1 OR US-11395544-B1 OR US-9504316-B1 OR WO-2017184206-A1 OR US-20130014674-A1 OR US-20140245932-A1 OR US-20160037909-A1 OR US-20180103752-A1 OR US-10258149-B2 OR US-20140238279-A1 OR US-9681746-B1).did.	USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				01:52 PM
L4914	26	("4221280" | "4577821" | "4995130" | "5186038" | "5322143" | "5588377" | "9161616" | "D845037" | "10264877" | "10517390" | "20100012909" | "20140041554" | "20160338486" | "20170354245" | "20180055214" | "20180146775").pn. OR ("10869549").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4915	36	(Artificial Intelligence) More like doc: US-10869549-B2 Text: (US-11382419-B2 OR US-20210052067-A1 OR US-20220257006-A1 OR US-20180192769-A1 OR CN-206338567-U OR US-11324310-B2 OR US-20220218100-A1 OR US-20210015248-A1 OR US-10820688-B2 OR WO-2019119920-A1 OR CN-214855133-U OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM

		CN-210383111-U OR AU-2018388926-A1 OR US-10856651-B2 OR US-10986918-B2 OR CN-110325077-B OR CA-3110698-A1 OR KR-20110018576-A OR CN-110325077-A OR US-11134774-B1).did.					
L4916	498714	Zheng.in. AND (desk OR table)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4917	96476	Zheng.in. AND (desk OR table) AND gas	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4918	367	Zheng.in. AND (desk OR table) AND gas ADJ spring	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4919	1286	(desk OR table) SAME (cross OR X) SAME gas ADJ spring	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4920	53	(Artificial Intelligence) More like doc: CN-204561316-U Text: (CN-204561320-U OR CN-204561505-U OR CN-206380909-U OR CN-206525754-U OR CN-106377063-A OR CN-206565530-U OR CN-206659424-U OR CN-203407686-U OR CN-205106786-U OR CN-105534016-A OR CN-109953482-A OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT;	OR	ON	ON	2022/09/21 01:52 PM

		CN-208573198-U OR CN-107280230-A OR US-10448731-B2 OR US-10188204-B2 OR US-20180199704-A1 OR WO-2018170012-A1 OR CN-108497692-A OR CN-204580308-U OR US-20180199705-A1).did.	IBM_TDB)				
L4921	36	ironing ADJ board SAME (gas OR pneumatic) ADJ spring	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4922	483	D06F AND (gas OR pneumatic) ADJ spring	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4923	2200	D06F AND three SAME legs	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4924	774	D06F AND three SAME legs AND pivot$4	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4925	40	(Artificial Intelligence) More like doc: CN-103422335-A Text: (CN-103541202-A OR CN-103422335-B OR CN-103541202-B OR CN-102628210-A OR FR-2990960-A1 OR EP-2666906-A2 OR US-8776410-B2 OR US-20130340301-A1 OR EP-2666906-B1 OR CA-2815319-C OR CA-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO;	OR	ON	ON	2022/09/21 01:52 PM

		2815319-A1 OR FR-2990961-A1 OR RU-2619020-C2 OR RU-2013122960-A OR US-20130312297-A1 OR EP-2666905-A2 OR US-8776411-B2 OR ES-2524240-T3 OR CN-104894826-A OR RU-2619021-C2).did.	JPO; DERWENT; IBM_TDB)				
L4926	4567	A47B AND (gas OR pneumatic) ADJ spring	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4927	252	A47B AND (gas OR pneumatic) ADJ spring AND three SAME legs	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4928	679	108/118,120,43,138,50.01,50.02.ccls. AND spring	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4929	94159	pivot$4 WITH rod WITH sleeve	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4930	4856	pivot$4 WITH rod WITH sleeve SAME legs	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4931	124	("1318564" | "2937003" | "3295800" | "3826457" | "4221280" | "4449262" | "4549720" | "4558648" | "4577821" | "4702454" | "4741512" | "4753419"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		| "4843978" | "D302893" | "4941641" | "4967672" | "4995130" | "5037163" | "5211367" | "5251864" | "5257767" | "5294087" | "5400720" | "5588377" | "5626323" | "5765797" | "5829948" | "5926876" | "5957426" | "6076785" | "6098961" | "6269753" | "6516478" | "6533229" | "6533479" | "6672430" | "6701853" | "6702372" | "6722618" | "6742768" | "6792876" | "7048236" | "7204193" | "7207629" | "7575205" | "7677518" | "7841570" | "7845665" | "7950338" | "8015638" | "8132518" | "8303062" | "8469152" | "8490933" | "8544391" | "8671853" | "8684339" | "8931750" | "8950343" | "9049923" | "9055810" | "9232855" | "9326598" | "9480332" | "9504316" | "9554644" | "9681746" | "9809136" | "9815672" | "9955780" | "9981571" | "9993068" | "10018298" | "10023355" | "D830739" | "10123613" | "D845037" | "10244861" | "10258148" | "10258149" | "10306977" | "D854775" | "10413055" | "10499730" | "10517390" | "10524565" | "10542817" | "10544019" | "10568416" | "10575630" | "D901959" | "10869549" | "10893748" | "20030213415" | "20050120922" | "20070080564" | "20070266912" | "20080000393" | "20090145336" | "20100242174" | "20110001033" | "20120097822" | "20120188302" | "20130193392" |				

		"20140144352" | "20150216296" | "20150289641" | "20160338486" | "20160353880" | "20170071332" | "20170174486" | "20170196351" | "20170354245" | "20180055214" | "20180177289" | "20200029685" | "20200107633").pn. OR ("11134774").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4932	70	("1318564" | "2937003" | "3295800" | "4221280" | "4558648" | "4577821" | "4843978" | "5588377" | "5626323" | "5829948" | "5957426" | "6098961" | "6269753" | "6516478" | "6533479" | "6722618" | "6742768" | "8132518" | "8671853" | "9049923" | "9055810" | "9326598" | "9480332" | "9504316" | "9554644" | "20030213415" | "20040035332" | "20040040480" | "20070080564" | "20080000393" | "20090090832" | "20090200437" | "20110001033" | "20110024958" | "20120097822" | "20130145972" | "20130193392" | "20140144352" | "20150232005" | "20150375896" | "20160338486" | "20170174486" | "20180008037").pn. OR ("10244861").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4933	35	("2003/0213415").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4934	38	("2994093" | "3365072" | "3491705" | "3495873" | "3897102" | "4264102" | "4470630" | "4686910"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		| "5246265" | "5926871" | "5950259").pn. OR ("6213555").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4935	8	("3365072").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4936	96	("1495991" | "3023063" | "3391960" | "3592144" | "4619386" | "4672898" | "4852499" | "4909159" | "5177665" | "5359349" | "5438936").pn. OR ("5673628").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4937	36	("5673628" | "5687945" | "6378829" | "D473562" | "6632170" | "D494183" | "6863252" | "6896231" | "7124755" | "7207537" | "7540457" | "7922137" | "8083196" | "8272604" | "8413943" | "8636257" | "8727290" | "20050006542" | "20050121578" | "20060261227" | "20070040089" | "20100108828" | "20100198052" | "20120175474" | "20120205503" | "20120273630" | "20140091193" | "20140226281").pn. OR ("9133982").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4938	51	("1382783" | "1460697" | "2508974" | "2839260" | "3170665" | "3734439" | "3840204" | "3910538" | "4131259" | "4143652" | "4402481" | "4458870" | "4491435" | "4535923" | "4721276" | "4997156" | "5370570" | "5484129" | "5609565" | "5723808" | "5964439" | "6170598" | "6325350" | "6431505" | "6457616" | "6575417").pn. OR ("6896231").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

L4939	1	("1794838").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4940	1325	108/64,65.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4941	58	(Artificial Intelligence) More like doc: CN-110507076-A Text: (CN-210169314-U OR CN-109998274-A OR CN-108371397-A OR CN-208875528-U OR CN-109953482-A OR CN-108497694-A OR CN-209216436-U OR CN-209202315-U OR CN-208573198-U OR CN-110250740-A OR CN-107692513-A OR CN-107397342-A OR CN-110074553-A OR CN-209547376-U OR CN-108741628-A OR CN-113951630-A OR CN-108784029-A OR CN-207613446-U OR CN-106473444-A OR US-20150216296-A1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4942	60	(Artificial Intelligence) More like doc: CN-111227513-A Text: (CN-110693195-A OR CN-104687774-A OR CN-108634582-A OR CN-105559349-A OR CN-105534042-A OR CN-110326893-A OR CN-110432658-A OR CN-107752392-A OR CN-108720296-A OR CN-108634586-A OR CN-108523441-A OR CN-108851567-A OR CN-105686343-A OR CN-104257107-A OR CN-108685331-A OR CN-110811153-A OR CN-108741800-A OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM

		CN-104382358-A OR CN-106108385-A OR CN-106490844-A).did.					
L4943	59	(Artificial Intelligence) More like doc: CN-110495716-A Text: (CN-110495715-A OR CN-108497721-A OR CN-107048775-A OR CN-108323926-A OR AT-12332-U1 OR CN-110934420-A OR CN-208278855-U OR CN-113367476-A OR CN-107997385-A OR AT-391249-B OR CN-110179244-A OR CN-106377063-A OR CN-203416937-U OR CN-101273819-A OR CN-109043811-A OR CA-2792935-A1 OR CN-108784034-A OR CN-110495710-A OR CN-107981536-A OR CN-110063581-A).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4944	7474	L-shaped SAME (desk OR table) AND A47B	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4945	740	L-shaped SAME (desk OR table) AND A47B AND 108/$.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4946	270	L-shaped SAME (desk OR table) AND A47B AND 312/$.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4947	43	("0349875" | "0654922" | "1280619" | "2141954" | "2590959" | "2722287" | "2854309" | "2981580" | "2988413" | "3066994"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		| "3856371" | "3992067" | "5451101" | "5496609").pn. OR ("5666887").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4948	25	("0308156" | "0917429" | "2755155" | "2815252" | "3079207" | "3125387" | "3164419").pn. OR ("3920298").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4949	21	("0822182" | "1513907" | "1652100" | "3379144" | "3549200").pn. OR ("3963272").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4950	36	(Artificial Intelligence) More like doc: US-3963272-A Text: (CA-1055382-A OR CA-1055381-A OR US-3977723-A OR US-8113128-B2 OR US-20110017103-A1 OR EP-0602450-A1 OR EP-0602450-B1 OR US-4019443-A OR US-3596985-A OR US-3411823-A OR US-9936800-B2 OR US-10390610-B2 OR US-20180184798-A1 OR US-1970874-A OR US-20170027318-A1 OR US-4194452-A OR US-20140020605-A1 OR US-3951449-A OR US-2024045-A OR US-1652100-A).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4951	35	(Artificial Intelligence) More like doc: US-20040040480-A1 Text: (US-6701853-B1 OR DE-202016102015-U1 OR US-6691626-B2 OR US-9326598-B1 OR US-20130145972-A1 OR US-20200015584-A1 OR TW-M516896-U OR US-8544391-B2 OR EP-3593671-A1 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA,	OR	ON	ON	2022/09/21 01:52 PM

		GB-2575456-A OR US-10842257-B2 OR EP-3593671-B1 OR TW-M536893-U OR US-9615655-B1 OR US-20170105518-A1 OR US-20030154890-A1 OR WO-2008074143-A1 OR CN-105901924-B OR CN-105901925-B OR US-5588377-A).did.	VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L4952	38	(Artificial Intelligence) More like doc: US-5588377-A Text: (US-6003450-A OR US-5375514-A OR US-5649493-A OR EP-0706769-A2 OR EP-0706769-A3 OR US-2846282-A OR US-20040040480-A1 OR US-6701853-B1 OR TW-M445388-U OR US-20150216296-A1 OR US-2579076-A OR DK-179639-B1 OR US-5697470-A OR US-5927212-A OR US-9326598-B1 OR US-8950343-B2 OR US-20140041554-A1 OR WO-2005032303-A1 OR WO-2016187212-A1 OR WO-2018137739-A1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4953	70	("2447480" | "3110476" | "3245366" | "4221280" | "5002293" | "5131501").pn. OR ("5588377").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4954	38	(Artificial Intelligence) More like doc: US-6427607-B1 Text: (US-20020078866-A1 OR US-20110062172-A1 OR US-9084500-B2 OR CA-2629354-C OR US-20110126739-A1 OR WO-2010138632-A2 OR US-8424464-B2 OR FR-3028735-A1 OR US-7246784-B1 OR US-10107447-B2 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO;	OR	ON	ON	2022/09/21 01:52 PM

		US-4784120-A OR US-20180106417-A1 OR US-4364699-A OR CN-110778881-A OR US-5009379-A OR WO-2010138632-A3 OR US-6684431-B2 OR US-20030084513-A1 OR US-5833200-A OR US-5598786-A).did.	JPO; DERWENT; IBM_TDB)				
L4955	28	("0126213" | "0186875" | "3410328" | "5339749" | "5429057" | "5460102" | "5476050" | "6170408" | "RE37239").pn. OR ("6427607").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4956	47	(Artificial Intelligence) More like doc: ES-1078409-U Text: (EP-2745733-A1 OR ES-1078409-Y OR US-11388991-B1 OR US-10893748-B1 OR WO-2008152161-A1 OR US-10244861-B1 OR US-11395544-B1 OR ES-1076663-U OR US-7950338-B2 OR DE-202016102015-U1 OR US-20090200437-A1 OR AU-2015247798-A1 OR CN-105686346-A OR FR-2901981-A1 OR CN-105686346-B OR US-20200000219-A1 OR US-10485336-B1 OR US-20190335898-A1 OR ES-2331985-A1 OR US-20180008037-A1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4957	35	(Artificial Intelligence) More like doc: US-4032103-A Text: (US-2974431-A OR US-4159821-A OR US-20180160799-A1 OR EP-3307108-A1 OR WO-2016200318-A1 OR US-20160286951-A1 OR CA-2925376-A1 OR US-4046221-A OR CN-107708486-A OR US-9808080-B2 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO;	OR	ON	ON	2022/09/21 01:52 PM

		TW-M445388-U OR US-5960904-A OR JP-2018520740-A OR US-20220178153-A1 OR AU-2020200957-A1 OR CA-2998072-A1 OR US-10815680-B2 OR US-9644378-B2 OR AU-2018201577-A1 OR WO-2016200318-A8).did.	JPO; DERWENT; IBM_TDB)				
L4958	49	(Artificial Intelligence) Similar to: Publication Status Unavailable from Similarity Search Text: (US-11160367-B1 OR US-11134773-B1 OR US-11140977-B1 OR US-10575630-B1 OR US-11147366-B1 OR US-10244861-B1 OR US-10568416-B1 OR US-11388989-B1 OR US-11134774-B1 OR KR-20140098842-A OR CA-2814945-A1 OR WO-2013176690-A1 OR EP-2685867-A1 OR AU-2012381034-A1 OR US-8671853-B2 OR US-10893748-B1 OR CA-2814945-C OR US-20130139736-A1 OR US-20180177289-A1 OR US-9055810-B2 OR US-20150250303-A1 OR US-20130340655-A1 OR US-9554644-B2 OR US-9961991-B1 OR US-10092089-B1 OR US-20140158026-A1 OR US-20180132607-A1 OR US-20170095072-A1 OR US-20160150876-A1 OR ES-2698967-T3 OR US-9277809-B2 OR US-10413053-B2 OR AU-2012381034-B2 OR AU-2012381034-C1 OR US-9924793-B2 OR JP-3198070-U OR US-11395544-B1 OR US-20180360208-A1 OR US-10159336-B2 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN))	OR	ON	ON	2022/09/21 01:52 PM

		CN-107136750-A OR US-20180084903-A1 OR US-11019920-B2 OR CN-214855133-U OR US-11337516-B1 OR US-20170196351-A1 OR WO-2018057751-A1 OR US-20190110588-A1 OR US-10306977-B2 OR CN-101431916-A OR CN-101431916-B).did.					
L4959	28	(Artificial Intelligence) More like doc: GB-307701-A Text: (GB-305060-A OR GB-163584-A OR AT-12332-U1 OR GB-136099-A OR US-2829936-A OR GB-321479-A OR GB-191160-A OR US-1881047-A OR GB-364874-A OR DE-3102182-A1 OR US-1994364-A OR GB-270985-A OR GB-305220-A OR US-1289245-A OR GB-617256-A OR GB-322625-A OR DE-3102182-C2 OR GB-177699-A OR GB-273611-A OR US-2557594-A).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4960	822	108/116,117.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4961	8	("3329104").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4962	1392	(A47B61/00).cpc. AND (gas OR pneumatic OR spring)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM

L4963	1963	312/194-196.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4964	76	("1192207" | "2366677" | "2825101" | "3069216" | "3298329" | "3713717" | "3730601" | "3790241").pn. OR ("4153311").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4965	870	A47B1/03.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4966	37	(Artificial Intelligence) More like doc: US-20060219149-A1 Text: (US-7383786-B2 OR US-7367279-B2 OR US-20080190350-A1 OR US-20060219150-A1 OR WO-2006105280-A1 OR US-20090249992-A1 OR US-7040248-B1 OR AU-2007231686-B2 OR US-3736897-A OR CA-2607629-C OR US-20080098947-A1 OR US-7654216-B2 OR US-7707955-B1 OR AU-2007231686-A1 OR US-2277171-A OR US-20110278524-A1 OR US-20100107952-A1 OR CN-108657376-B OR CN-108657376-A OR EP-2106362-A2).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4967	59	("2230444" | "4709972" | "4735467" | "4742429" | "4766422" | "4931978" | "5359349" | "5377951" | "5424912" | "5452950" | "5555491" | "5564668"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		| "5651594" | "5655743" | "5717567" | "5733025" | "5771814" | "5808373" | "5850539" | "5859762" | "6020654" | "D425877" | "6113050" | "6152411" | "6163079" | "6169655" | "6185096" | "6202568").pn. OR ("6626686").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4968	17703	A47B21/0314,00,02,03.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4969	4042	A47B21/0314,00,02,03.cpc. AND (spring OR pneumatic OR gas)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4970	2791	A47B21/0314,00,02,03.cpc. AND (spring OR pneumatic OR gas) SAME (slid$4 OR pivot$4 OR rotat$4)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4971	47	(Artificial Intelligence) More like doc: US-11311100-B1 Text: (CN-215649727-U OR CN-110916344-B OR CN-112998452-A OR WO-2018072365-A1 OR US-20200029685-A1 OR WO-2022116627-A1 OR US-20210345768-A1 OR WO-2021226487-A1 OR US-20170105518-A1 OR US-9615655-B1 OR CN-111938297-A OR US-20170354245-A1 OR AU-2015247798-A1 OR CN-113367506-A	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM

		OR WO-2019041579-A1 OR CN-2891792-Y OR WO-2022166615-A1 OR CA-2814945-C OR CN-113940498-A OR US-10856651-B2).did.					
L4972	430	A47B2021/0321,0364.cpc. AND (spring OR pneumatic OR gas) SAME (slid$4 OR pivot$4 OR rotat$4)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4973	12	((("PONIATOWSKI") near3 ("Nathan"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/09/21 01:52 PM
L4974	49	("10111518"|"20150321891"|"20170340104"|"20170354245"|"20170360192"|"20180192769"|"2850203"|"9815672").PN.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4975	8	((("HO") near3 ("Chih-Feng"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/09/21 01:52 PM
L4976	6151	A47B21/02.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4977	1228	A47B21/02.cpc. AND (arms OR links OR beams) SAME (pivot$4 OR rotat$4)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4978	37	(Artificial Intelligence) More like doc: KR-20210028764-A Text: (KR-102297093-B1 OR KR-102076298-B1 OR KR-20160100205-A OR KR-20190082702-A OR KR-20170124492-A OR JP-3207307-U OR KR-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO,	OR	ON	ON	2022/09/21 01:52 PM

		20160115234-A OR KR-101969136-B1 OR KR-20160100206-A OR KR-20170127389-A OR KR-101703230-B1 OR KR-20160100208-A OR KR-101969137-B1 OR KR-101969135-B1 OR KR-20170127387-A OR KR-20170127388-A OR KR-20170128765-A OR CN-107257640-B OR EP-3257400-A1 OR KR-20170127386-A).did.	RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L4979	44	(Artificial Intelligence) More like doc: JP-3207307-U Text: (CN-205696492-U OR TW-M535020-U OR US-9861192-B2 OR US-20170273453-A1 OR KR-20210028764-A OR CN-106942901-A OR CN-109106059-A OR CN-106473451-B OR CN-110652108-A OR US-6546880-B2 OR TW-M549567-U OR US-8661989-B2 OR US-9635929-B1 OR US-20180177289-A1 OR CN-110025135-A OR US-9961991-B1 OR CN-112107160-A OR CN-108932021-A OR CN-107637964-A OR US-20010037751-A1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4980	41	("20030047488"|"20040040480"|"20040094077"|"20060087166"|"20070034125"|"20140158024"|"5588377"|"5996961"|"7677518"|"9635929"|"D588832").PN.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4981	33	("2004/0040480").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4982	87	("1318564" | "2937003" | "3295800" | "4221280" | "4558648" | "4577821" | "4843978" | "5037163" | "5211367" | "5257767"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		| "5588377" | "5626323" | "5829948" | "5957426" | "6076785" | "6098961" | "6269753" | "6516478" | "6533479" | "6701853" | "6722618" | "6742768" | "6792876" | "7677518" | "7841570" | "7950338" | "8132518" | "8544391" | "8671853" | "8684339" | "8931750" | "9049923" | "9326598" | "9480332" | "9504316" | "9554644" | "9681746" | "10159336" | "10244861" | "10258148" | "10258149" | "10499730" | "10542817" | "20030213415" | "20040040480" | "20070080564" | "20080000393" | "20120097822" | "20130193392" | "20130199420" | "20140144352" | "20140158026" | "20150232005" | "20150368082" | "20150375896" | "20160051042" | "20160106205" | "20160170402" | "20160260019" | "20160309889" | "20160338486" | "20160353880" | "20170174486" | "20170360192" | "20180008037" | "20180125227" | "20180177289" | "20180279770" | "20180360208" | "20190110588" | "20190269237" | "20200029685").pn. OR ("10893748").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4983	42	("0078250" | "0148329" | "0316363" | "0349974" | "1318564" | "4032103" | "4296694" | "4384533" | "4993706" | "6306066" | "7048236").pn. OR	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		("7950338").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4984	48	("0848465" | "1214086" | "2170098" | "2805905" | "2829928" | "2843391" | "3022037" | "3094948" | "3741512").pn. OR ("4032103").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4985	2012	A47B13/088.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4986	1694	108/147.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4987	26	("3080835" | "3825244" | "4894600" | "4979718" | "5174223" | "5437236" | "5526898" | "5531413" | "5553550" | "5562052" | "5598788" | "5620067" | "5636394").pn. OR ("6021722").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4988	40	("0885748" | "1165144" | "1417096" | "2260694" | "3339599" | "3778125" | "4130070" | "4381714" | "4440096").pn. OR ("4805538").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4989	20	52/36.1.ccls. AND L-shape	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4990	152	52/36.1.ccls. AND (pnuematic OR spring)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD,	OR	ON	ON	2022/09/21 01:52 PM

			DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L4991	35	(Artificial Intelligence) More like doc: US-20040040480-A1 Text: (US-6701853-B1 OR DE-202016102015-U1 OR US-6691626-B2 OR US-9326598-B1 OR US-20130145972-A1 OR US-20200015584-A1 OR TW-M516896-U OR US-8544391-B2 OR EP-3593671-A1 OR GB-2575456-A OR US-10842257-B2 OR EP-3593671-B1 OR TW-M536893-U OR US-9615655-B1 OR US-20170105518-A1 OR US-20030154890-A1 OR WO-2008074143-A1 OR CN-105901924-B OR CN-105901925-B OR US-5588377-A).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4992	38	(Artificial Intelligence) More like doc: US-5588377-A Text: (US-6003450-A OR US-5375514-A OR US-5649493-A OR EP-0706769-A2 OR EP-0706769-A3 OR US-2846282-A OR US-20040040480-A1 OR US-6701853-B1 OR TW-M445388-U OR US-20150216296-A1 OR US-2579076-A OR DK-179639-B1 OR US-5697470-A OR US-5927212-A OR US-9326598-B1 OR US-8950343-B2 OR US-20140041554-A1 OR WO-2005032303-A1 OR WO-2016187212-A1 OR WO-2018137739-A1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4993	70	("D296761" | "D301433" | "D317559" | "D355110" | "0945753" |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM

		"1786823" | "3783175" | "3873758" | "3883202" | "4053701" | "4094256" | "4163867" | "4296981" | "4323291" | "4372629" | "4422385" | "4654756" | "4721476" | "4730363" | "4734826" | "4792881" | "4840514" | "4864078" | "4884513" | "4948205" | "4984982" | "5008975" | "5050267" | "5083512" | "5103741" | "5121698" | "5130494" | "5154126" | "5167047" | "5230552" | "5231562" | "5237935" | "5272988" | "5427265" | "5429431").pn. OR ("5860713").urpn. AND (PGPB | USPT | USOC).dbnm.					
L4994	40	("0885748" | "1165144" | "1417096" | "2260694" | "3339599" | "3778125" | "4130070" | "4381714" | "4440096").pn. OR ("4805538").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L4995	39	(Artificial Intelligence) More like doc: US-3920298-A Text: (CA-1033799-A OR GB-2232585-A OR US-2362047-A OR US-3079207-A OR US-3709577-A OR US-3346311-A OR GB-2025211-A OR US-2795471-A OR US-4176889-A OR US-1281923-A OR US-3371973-A OR DE-1952062-A1 OR DE-6940177-U OR EP-1088497-A2 OR DE-60024745-T2 OR GB-1244170-A OR DE-1802293-A1 OR SE-535103-C2 OR EP-1088497-A3 OR US-2594571-A).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4996	81	("20170273453"|"9289066"|"20150068423"|"20040040480"|"5588377"|"5860713"|"4805538"|"4	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR,	OR	ON	ON	2022/09/21 01:52 PM

		032103"|"3920298"|"3329104"|"2836475").PN.	GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L4997	0	A47B3/16.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4998	2518	A47B9/16.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L4999	6713	A47B13/081.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L5000	6299	A47B9/00.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L5001	23	A47B9/00.cpc. AND (cross ADJ (arms OR links))	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L5002	600	A47B9/00.cpc. AND (lift$4 AND (arms OR links))	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L5003	482	108/145.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR,	OR	ON	ON	2022/09/21 01:52 PM

			GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L5004	15	("2008/0010935").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L5005	41	(Artificial Intelligence) More like doc: US-20080010935-A1 Text: (US-8037642-B2 OR US-20070204771-A1 OR US-7866268-B2 OR US-20070215765-A1 OR US-20180055229-A1 OR US-8066240-B2 OR EP-3287041-A2 OR US-20210169220-A1 OR US-10264879-B2 OR CA-2800009-A1 OR CA-2799938-A1 OR US-20200352325-A1 OR US-20090282663-A1 OR US-20210085079-A1 OR CA-2741884-A1 OR CA-2799938-C OR US-8667908-B2 OR US-9611641-B2 OR EP-3323313-A1 OR CA-2799962-A1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L5006	41	(Artificial Intelligence) More like doc: DE-202021105539-U1 Text: (DE-102019112984-A1 OR DE-202019102871-U1 OR EP-2260229-A1 OR DE-202017104130-U1 OR DE-8319405-U1 OR DE-102020006084-A1 OR DE-7329444-U OR DE-202022102372-U1 OR DE-202008004809-U1 OR ES-2808980-T3 OR DE-1885621-U OR DE-1902551-A1 OR DE-4112180-A1 OR DE-202020107445-U1 OR DE-7442087-U OR DE-1987299-U OR DE-1956024-U OR DE-102013208559-B4 OR DE-202019101873-U1 OR DE-3214443-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM

		C1).did.					
L5007	8	((("HO") near3 ("Chih-Feng"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/09/21 01:52 PM
L5008	28	((("HO") near3 ("Chih-Feng"))).INV.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L5009	17	("10244861"|"20040187742"|"20160345723"|"20170273453"|"20170340104"|"20170354244"|"20180064244"|"20180255919"|"20180279770"|"20190045923"|"20190365089"|"20200281349"|"5323695"|"5339750"|"5483898"|"5752449"|"6701853").PN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L5010	19	("20030047488"|"20040040480"|"20040094077"|"20060087166"|"20070034125"|"20140158024"|"5588377"|"5996961"|"7677518"|"9635929"|"D588832").PN.	(US-PGPUB; USPAT; USOCR; FPRS)	OR	ON	ON	2022/09/21 01:52 PM
L5011	45	(Artificial Intelligence) More like doc: DE-202021101245-U1 Text: (WO-2022061390-A1 OR AT-524026-A4 OR DE-2018722-C OR DE-202020105403-U1 OR DE-202016106868-U1 OR DE-7140668-U OR DE-102015221114-A1 OR DE-202020107522-U1 OR DE-202019101371-U1 OR DE-3535303-A1 OR DE-8319405-U1 OR WO-2009124523-A1 OR DE-202005006439-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM

		U1 OR KR-20210000012-U OR DE-19700582-A1 OR CN-214072272-U OR TW-M613202-U OR CN-214258361-U OR CN-112425891-A OR US-20220007830-A1).did.					
L5012	59	(Artificial Intelligence) More like doc: CN-109953483-A Text: (CN-210539655-U OR CN-208403742-U OR CN-110025127-A OR CN-209185855-U OR CN-109090829-A OR CN-109549347-A OR CN-109645665-A OR CN-208096475-U OR CN-112401465-A OR CN-108294476-A OR CN-108260926-A OR CN-109008234-A OR CN-205267437-U OR CN-109077456-A OR CN-107095445-A OR CN-202714432-U OR CN-108451170-A OR CN-108095337-A OR CN-209235181-U OR CN-215423333-U).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L5013	380	"307701"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L5014	0	"GB307701"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L5015	3	"GB 307701"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT;	OR	ON	ON	2022/09/21 01:52 PM

			IBM_TDB)				
L5016	50	(Artificial Intelligence) More like doc: WO-2021226487-A1 Text: (US-20210345768-A1 OR CN-107708486-A OR CN-114376342-A OR CN-108201228-A OR TW-I734827-B OR CN-209403998-U OR AU-2020200160-B2 OR US-10813448-B2 OR CN-108968347-B OR KR-101674369-B1 OR CN-111132578-B OR JP-2021515653-A OR DE-102020125883-A1 OR WO-2022069741-A1 OR KR-20110006306-U OR US-20150216296-A1 OR CN-110664113-A OR WO-2006111742-A1 OR EP-1874155-A1 OR CN-112165886-A).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
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L5021	39	(Artificial Intelligence) More like doc: US-9072645-B2	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY,	OR	ON	ON	2022/09/21 01:52 PM

		Text: (WO-2012033857-A1 OR US-20120060291-A1 OR US-10531997-B2 OR US-20170266073-A1 OR WO-2006127536-A2 OR US-20060260516-A1 OR CN-106793868-B OR US-4451945-A OR US-4449262-A OR CN-111642896-A OR WO-2018014213-A1 OR DE-202006014884-U1 OR US-4817220-A OR CA-1275433-C OR EP-0074053-A3 OR US-20080047068-A1 OR US-5697471-A OR EP-0221037-A2 OR EP-0221037-A3 OR US-20020178501-A1).did.	CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
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L5023	4	wilkens.xp. AND ironing ADJ board	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU,	OR	ON	ON	2022/09/21 01:52 PM

			SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L5024	268	wilkens.xp. AND (X OR cross) WITH (legs OR supports)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
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L5027	9	("10111518"|"20150321891"|"20170340104"|"20170354245"|"20170360192"|"20180192769"|"2850203"|"9815672").PN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
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L5029	107	38/138.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L5030	482	108/145.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L5031	848	108/20.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP,	OR	ON	ON	2022/09/21 01:52 PM

			AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
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L5034	40	("1234569" | "1895290" | "1982205" | "2557594" | "2624469" | "2908984" | "2968059" | "3152833" | "5199930" | "5542639").pn. OR ("6182935").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/21 01:52 PM
L5035	12865	(A47B3/02 OR A47B9/16 OR A47B21/02 OR A47B2003/025 OR A47B2200/0058 OR A47B2200/0063 OR A47B2200/0088 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT;	OR	ON	ON	2022/09/21 01:52 PM

		A47B21/04).cpc.	IBM_TDB)				
L5036	4842	(A47B3/02 OR A47B9/16 OR A47B21/02 OR A47B2003/025 OR A47B2200/0058 OR A47B2200/0063 OR A47B2200/0088 OR A47B21/04).cpc. AND (motor OR actuator OR spring)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L5037	991	(A47B3/02 OR A47B9/16 OR A47B21/02 OR A47B2003/025 OR A47B2200/0058 OR A47B2200/0063 OR A47B2200/0088 OR A47B21/04).cpc. AND (motor OR actuator OR spring) SAME (scissor OR cross OR X)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L5038	50	(Artificial Intelligence) More like doc: WO-2021226487-A1 Text: (US-20210345768-A1 OR CN-107708486-A OR CN-114376342-A OR CN-108201228-A OR TW-I734827-B OR CN-209403998-U OR AU-2020200160-B2 OR US-10813448-B2 OR CN-108968347-B OR KR-101674369-B1 OR CN-111132578-B OR JP-2021515653-A OR DE-102020125883-A1 OR WO-2022069741-A1 OR KR-20110006306-U OR US-20150216296-A1 OR CN-110664113-A OR WO-2006111742-A1 OR EP-1874155-A1 OR CN-112165886-A).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L5039	58	(Artificial Intelligence) More like doc: CN-209403998-U Text: (CN-207606798-U OR CN-207744840-U OR CN-208259359-U OR CN-209403938-U OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV,	OR	ON	ON	2022/09/21 01:52 PM

		CN-207236414-U OR CN-209017975-U OR CN-206453483-U OR CN-212345742-U OR CN-208957139-U OR CN-208480780-U OR CN-202043837-U OR CN-209185891-U OR CN-204273640-U OR CN-207653811-U OR CN-201888446-U OR CN-104586075-A OR WO-2021226487-A1 OR US-20210345768-A1 OR CN-203244090-U OR CN-210901953-U).did.	MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L5040	85	((("DOWDLE") near3 ("Colin")) OR (("DOWDLE") near3 ("James")) OR (("CRUVER") near3 ("Curtis")) OR (("DERFINY") near3 ("Stephen"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/09/21 01:52 PM
L5041	49	(Artificial Intelligence) More like doc: CN-110367687-A Text: (CN-204245481-U OR CN-203986713-U OR CN-110495708-A OR CN-201938719-U OR CN-209090377-U OR CN-204670620-U OR CN-109189192-B OR CN-201295016-Y OR US-10085550-B1 OR GB-739932-A OR KR-200366069-Y1 OR CN-206079773-U OR CN-217309511-U OR CN-110403354-A OR WO-2022129043-A1 OR CN-106690930-A OR CN-109793376-A OR DE-102020133410-A1 OR FR-2236342-A6 OR CN-110495716-A).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
L5042	7847	A61G13/009,06.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM

L5043	1107	A61G13/009,06.cpc. AND (motor OR actuator OR spring) SAME (scissor OR cross OR X)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 01:52 PM
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L5045	1119	ironing ADJ board AND (motor OR actuator OR spring) SAME (scissor OR cross OR X)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 02:08 PM
L5046	19140	A47B AND (motor OR actuator OR spring) SAME (scissor OR cross OR X)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 02:33 PM
L5047	6221	A47B AND (motor OR actuator OR spring) SAME (scissor OR cross OR X) SAME (table OR board OR desk)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 02:35 PM

L5048	914	A47B AND (motor OR actuator OR spring) SAME (scissor OR cross OR X) SAME (table OR board OR desk) SAME (wheels OR castors)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 02:36 PM
L5049	162	D06F AND (motor OR actuator OR spring) SAME (scissor OR cross OR X) SAME (table OR board OR desk) SAME (wheels OR castors)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/21 04:13 PM
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PE2E SEARCH - Search History (Interference)

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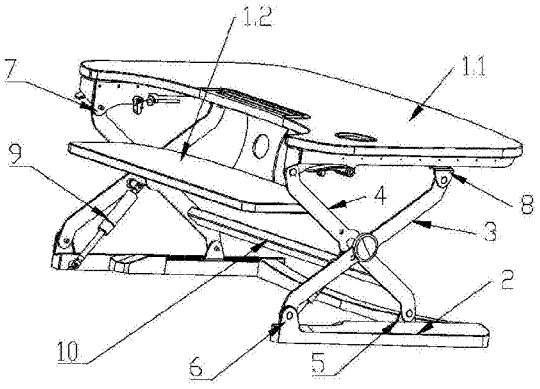
权利要求书1页 说明书3页 附图4页

(54)发明名称

升降工作台

(57)摘要

本发明提供一种升降工作台，它包括下支座、上支座，所述下支座和上支座之间设有至少一组X型升降机构，所述升降工作台还包括弹性元件，所述弹性元件的第一端连接在所述第一支杆或第二支杆的两端点之间，弹性元件的第二端连接在下支座或相对于下支座可滑动的第二铰接座上，所述弹性元件用于抵消或部分抵消上支座承重。本发明通过弹性元件来提供支撑力，用于抵消或部分抵消上支座承重，这样可以将工作台停留在任意高度，结构简单，成本较低。而且采用这种X型升降机构，在上支座升降的过程中，上支座的前后位置不会发生变化，比较实用。



CN 105124920 A

1. 一种升降工作台，它包括下支座、上支座，所述下支座和上支座之间设有至少一组 X 型升降机构，其特征在于：所述每组 X 型升降机构包括两个中间位置相互铰接成 X 型的支杆：第一支杆和第二支杆，所述下支座上设有固定在下支座上的第一铰接座以及相对于下支座可滑动的第二铰接座，所述上支座上设有固定在上支座上的第三铰接座以及相对于上支座可滑动的第四铰接座，所述第一支杆的下端与第一铰接座铰接，上端与第四铰接座铰接，所述第二支杆的下端与第二铰接座铰接，上端与第三铰接座铰接，所述升降工作台还包括弹性元件，所述弹性元件的第一端连接在所述第一支杆或第二支杆的两端点之间，弹性元件的第二端连接在下支座或相对于下支座可滑动的第二铰接座上，所述弹性元件用于抵消或部分抵消上支座承重。

2. 根据权利要求 1 所述的升降工作台，其特征在于：所述弹性元件设置在下支座和第一支杆之间，所述弹性元件的第一端与下支座铰接，弹性元件的第二端与第一支杆铰接。

3. 根据权利要求 1 所述的升降工作台，其特征在于：所述弹性元件设置在第二铰接座和第二支杆之间，所述弹性元件的第一端与第二铰接座铰接，弹性元件的第二端与第二支杆铰接。

4. 根据权利要求 2 或 3 所述的升降工作台，其特征在于：所述弹性元件为压缩气弹簧或机械压缩弹簧。

5. 根据权利要求 1 所述的升降工作台，其特征在于：所述弹性元件设置在下支座和第二支杆之间，所述弹性元件的第一端与下支座铰接，弹性元件的第二端与第二支杆铰接。

6. 根据权利要求 1 所述的升降工作台，其特征在于：所述弹性元件设置在第二铰接座和第一支杆之间，所述弹性元件的第一端与第二铰接座铰接，弹性元件的第二端与第一支杆铰接。

7. 根据权利要求 5 或 6 所述的升降工作台，其特征在于：所述弹性元件为拉伸气弹簧或拉簧。

8. 根据权利要求 1 所述的升降工作台，其特征在于：所述上支座上设有滑轨，所述第四铰接座在滑轨中滑动，所述第四铰接座上沿滑轨方向设有条形滑动块，所述滑动块上沿所述第四铰接座的滑动方向设有若干个槽孔，所述上支座上还设有一销子，所述销子通过一拉索及扳手控制，用于控制销子插入槽孔或者脱离槽孔。

9. 根据权利要求 1 所述的升降工作台，其特征在于：所述上支座上还设有桌板，桌板下方设有键盘托，所述键盘托、桌板与上支座同步运动。

10. 根据权利要求 1 所述的升降工作台，其特征在于：所述 X 型升降机构有两组，分别设置在上支座的两边，所述两组 X 型升降机构之间用横板连接。

升降工作台

技术领域：

[0001] 本发明涉及一种升降工作台。

背景技术：

[0002] 现有技术中的升降工作台大部分是利用机械弹簧或者扭簧来提供上升的弹力，并且一般是采用支杆的结构来使得台面相对于下支座上升或下降，结构比较复杂，成本较高。

发明内容：

[0003] 本发明解决的技术问题是，克服现有的技术缺陷，提供一种结构简单、成本较低的升降工作台。

[0004] 本发明提供的技术方案是：本发明提供一种升降工作台，它包括下支座、上支座，所述下支座和上支座之间设有至少一组X型升降机构，其特征在于：所述每组X型升降机构包括两个中间位置相互铰接成X型的支杆：第一支杆和第二支杆，所述下支座上设有固定在下支座上的第一铰接座以及相对于下支座可滑动的第二铰接座，所述上支座上设有固定在上支座上的第三铰接座以及相对于上支座可滑动的第四铰接座，所述第一支杆的下端与第一铰接座铰接，上端与第四铰接座铰接，所述第二支杆的下端与第二铰接座铰接，上端与第三铰接座铰接，所述升降工作台还包括弹性元件，所述弹性元件的第一端连接在所述第一支杆或第二支杆的两端点之间，弹性元件的第二端连接在下支座或相对于下支座可滑动的第二铰接座上，所述弹性元件用于抵消或部分抵消上支座承重。

[0005] 采用上述结构后，本发明具有以下优点：本发明通过弹性元件来提供支撑力，用于抵消或部分抵消上支座承重，这样可以将工作台停留在任意高度，结构简单，成本较低。而且采用这种X型升降机构，在上支座升降的过程中，上支座的前后位置不会发生变化，比较实用。

[0006] 作为优选，所述弹性元件设置在下支座和第一支杆之间，所述弹性元件的第一端与下支座铰接，弹性元件的第二端与第一支杆铰接。

[0007] 所述弹性元件设置在第二铰接座和第二支杆之间，所述弹性元件的第一端与第二铰接座铰接，弹性元件的第二端与第二支杆铰接。

[0008] 所述弹性元件为压缩气弹簧或机械压缩弹簧。

[0009] 所述弹性元件设置在下支座和第二支杆之间，所述弹性元件的第一端与下支座铰接，弹性元件的第二端与第二支杆铰接。

[0010] 所述弹性元件设置在第二铰接座和第一支杆之间，所述弹性元件的第一端与第二铰接座铰接，弹性元件的第二端与第一支杆铰接。

[0011] 所述弹性元件为拉伸气弹簧或拉簧。

[0012] 所述上支座上设有滑轨，所述第四铰接座在滑轨中滑动，所述第四铰接座上沿滑轨方向设有条形滑动块，所述滑动块上沿所述第四铰接座的滑动方向设有若干个槽孔，所述上支座上还设有一销子，所述销子通过一拉索及扳手控制，用于控制销子插入槽孔或者

脱离槽孔。采用这种结构，可以在上支座升降到某个位置时，通过销子插入槽孔中，来固定上支座升降的位置，需要调整位置时，则通过扳手以及拉索将销从槽孔中拉出，则可以继续调节上支座的高度。

[0013] 所述上支座上还设有桌板，桌板下方设有键盘托，所述键盘托、桌板与上支座同步运动。采用键盘托可以放置键盘。

[0014] 所述 X 型升降机构有两组，分别设置在上支座的两边，所述两组 X 型升降机构之间用横板连接。采用这种结构可以使上支座两边的 X 型升降机构同步运动，而且还可以加强升降工作台的强度。

附图说明：

[0015] 附图 1 为本发明正面的结构示意图；

[0016] 附图 2 为本发明背面的结构示意图；

[0017] 附图 3 为实施例之一；

[0018] 附图 4 为实施例之二；

[0019] 附图 5 为实施例之三；

[0020] 附图 6 为实施例之四；

[0021] 附图 7 为实施例之五；

[0022] 附图 8 为实施例之六；

[0023] 附图 9 为锁止机构的结构示意图；

[0024] 附图 10 为图 9 中的 A 处放大结构示意图。

[0025] 如图所示：1、上支座，1.1、桌板，1.2、键盘托，1.3、滑轨，2、下支座，3 第一支杆，4、第二支杆，5、第二铰接座，6、第一铰接座，7、第三铰接座，8、第四铰接座，9、弹性元件，9.1、气弹簧，9.2、弹簧，10、横板，11、扳手，12、拉索，13、滑动块，14、槽孔，15、销子。

具体实施方式

[0026] 下面结合附图和具体实施例对本发明做详细说明：

[0027] 如图 1- 图 10 所示：本发明提供一种升降工作台，它包括下支座 2、上支座 1，所述下支座 2 和上支座 1 之间设有至少一组 X 型升降机构，所述每组 X 型升降机构包括两个中间位置相互铰接成 X 型的支杆：第一支杆 3 和第二支杆 4，所述下支座 2 上设有固定在下支座上的第一铰接座 6 以及相对于下支座 2 可滑动的第二铰接座 5，所述上支座 1 上设有固定在上支座 1 上的第三铰接座 7 以及相对于上支座 1 可滑动的第四铰接座 8，所述第一支杆 3 的下端与第一铰接座 6 铰接，上端与第四铰接座 8 铰接，所述第二支杆 4 的下端与第二铰接座 5 铰接，上端与第三铰接座 7 铰接，所述升降工作台还包括弹性元件 9，所述弹性元件 9 的第一端连接在所述第一支杆 3 或第二支杆 4 的两端点之间，弹性元件 9 的第二端连接在下支座 2 或相对于下支座 2 可滑动的第二铰接座 5 上，所述弹性元件 9 用于抵消或部分抵消上支座 1 承重。

[0028] 在上支座升降的过程中第二铰接座 5 和第四铰接座 8 分别相对于下支座和上支座可滑动，从而可以调节 X 型升降机构，使上支座升降。

[0029] 图 3 为实施例之一、此实施例中，所述弹性元件 9 为气弹簧 9.1、气弹簧 9.1 的第一

端连接在所述第一支杆 3 的两端点之间，气弹簧 9.1 的第二端连接在下支座 2 上。此实施例中所述气弹簧为压缩气弹簧，即该气弹簧提供向上的弹力。

[0030] 图 4 为实施例之二、此实施例中，所述弹性元件 9 为气弹簧 9.1、气弹簧 9.1 的第一端连接在所述第二支杆 4 的两端点之间，气弹簧 9.1 的第二端连接在第二铰接座 5 上。此实施例中所述气弹簧为压缩气弹簧，即该气弹簧提供向上的弹力。

[0031] 图 5 为实施例之三、此实施例中，所述弹性元件 9 为弹簧 9.2、弹簧 9.2 的第一端连接在所述第二支杆 4 的两端点之间，弹簧 9.2 的第二端连接在下支座 2 上，此实施例中，弹簧 9.2 为拉簧。即该弹簧提供收缩的拉力。

[0032] 图 6 为实施例之四、此实施例中，所述弹性元件 9 为弹簧 9.2、弹簧 9.2 的第一端连接在所述第一支杆 3 的两端点之间，弹簧 9.2 的第二端连接在上支座 1 上，此实施例中，弹簧 9.2 为拉簧。即该弹簧提供收缩的拉力。可以看出该实施例与实施例之三实际上结构相同，只是跟实施例之二为对称结构，即将本实施例中的上支座 1 看成实施例之三中的下支座 2。将本实施例中的第一支杆 3 看成实施例之三中的第二支杆 4，则该结构与实施例之三相同。这种与实施例之三对称的结构，也应在本申请保护范围之内。

[0033] 图 7 为实施例之五，此实施例为实施例之一的对称结构。

[0034] 图 8 为实施例之六，此实施例为实施例之二的对称结构。

[0035] 本申请实施例包括但不限于上述实施例。

[0036] 如图 9-10 所示，所述上支座 1 上设有滑轨 1.3，所述第四铰接座 8 在滑轨 1.3 中滑动，所述第四铰接座 8 上沿滑轨 1.3 方向设有条形滑动块 13，滑动块 13 与第四铰接座 8 同步运动，所述滑动块 13 上沿所述第四铰接座 8 的滑动方向设有若干个槽孔 14，所述上支座 1 上还设有一销子 15，所述销子 15 通过一拉索 12 及扳手 11 控制，用于控制销子 15 插入槽孔 14 或者脱离槽孔 14。采用这种结构，可以在上支座升降到某个位置时，通过销子插入槽孔中，来固定上支座升降的位置，需要调整位置时，则通过扳手以及拉索将销从槽孔中拉出，则可以继续调节上支座的高度。该结构给升降工作台提供了一个锁止机构，可以在工作台上升到一定高度时进行锁止，防止工作台下降。

[0037] 所述上支座 1 上还设有桌板 1.1，桌板 1.1 下方设有键盘托 1.2，所述键盘托 1.2、桌板 1.1 与上支座 1 同步运动。如果将上支座 1 放到下面，将下支座 2 放到上面，则可以在下支座 2 上设置桌板和键盘托，这种结构实际上与本申请所述结构相同。

[0038] 所述 X 型升降机构有两组，分别设置在上支座 1 的两边，所述两组 X 型升降机构之间用横板 10 连接。采用这种结构可以使上支座两边的 X 型升降机构同步运动，而且还可以加强升降工作台的强度。

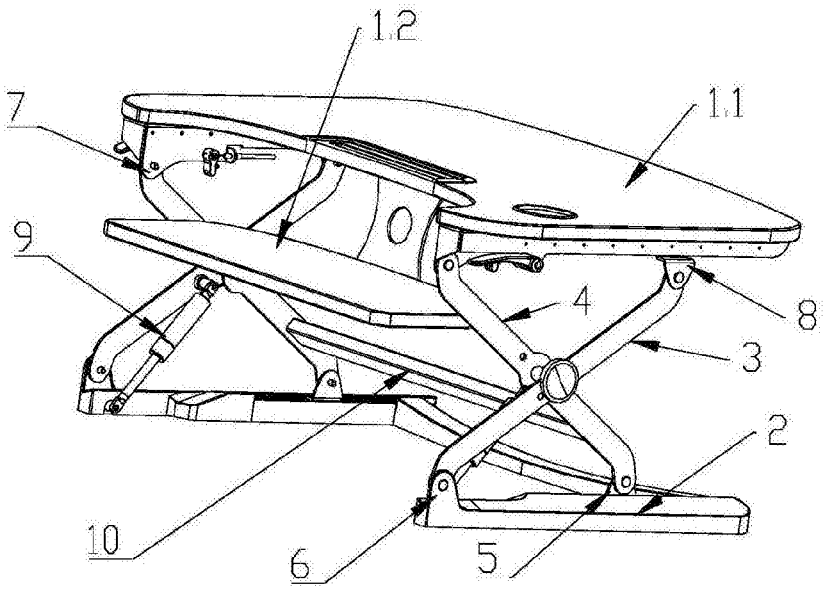


图 1

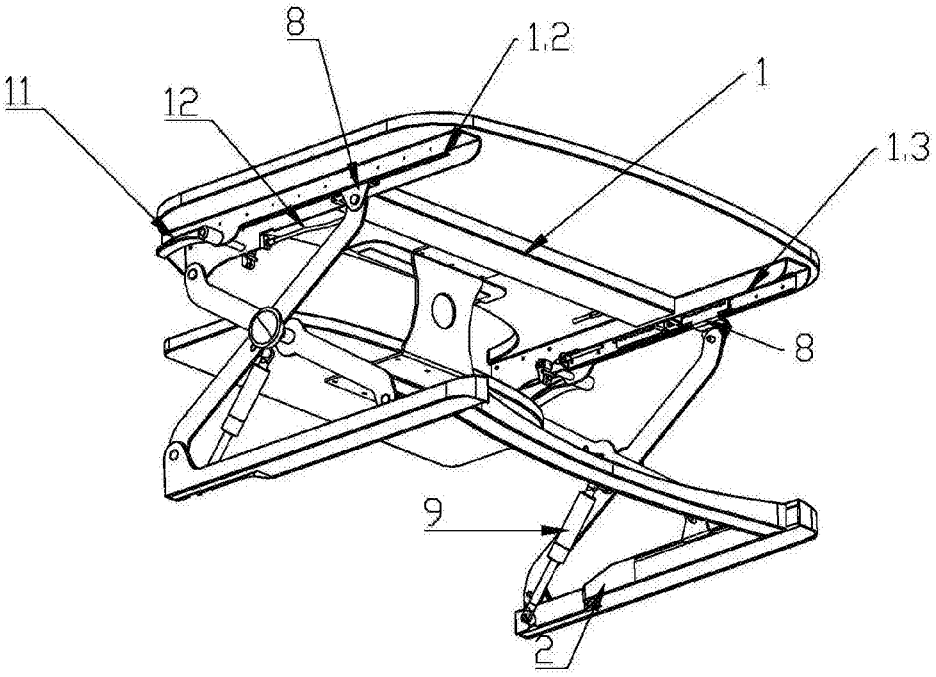


图 2

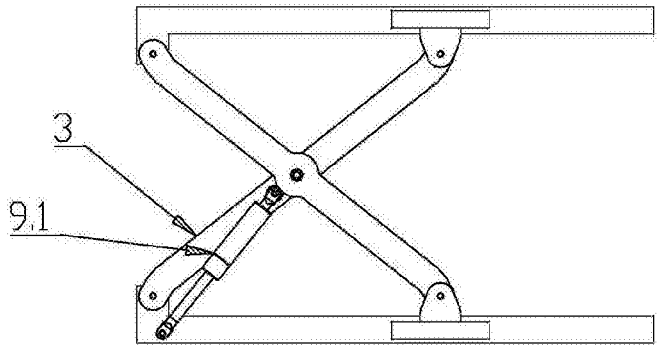


图 3

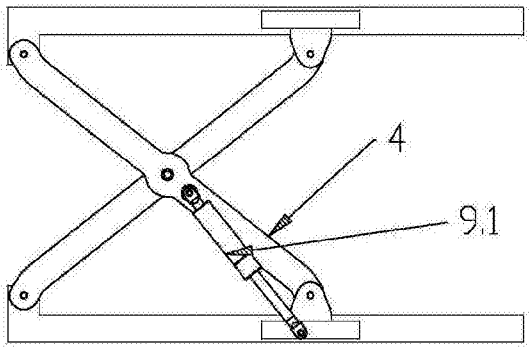


图 4

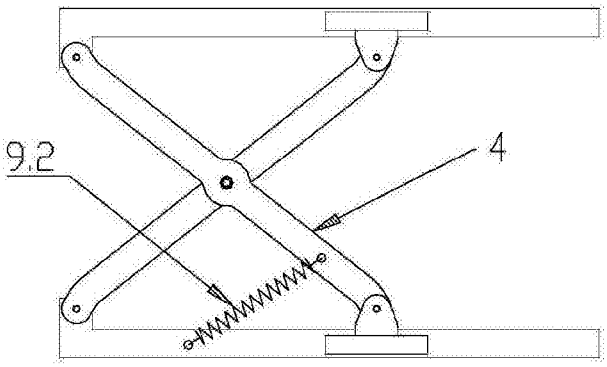


图 5

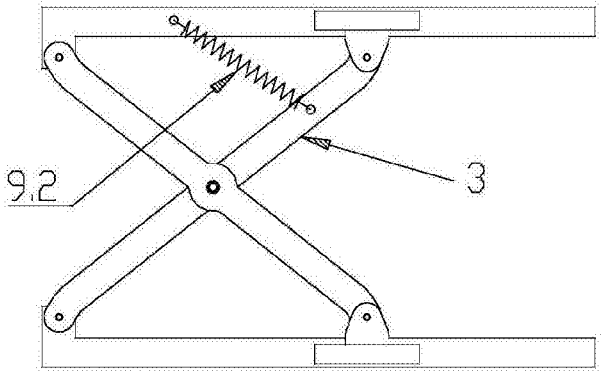


图 6

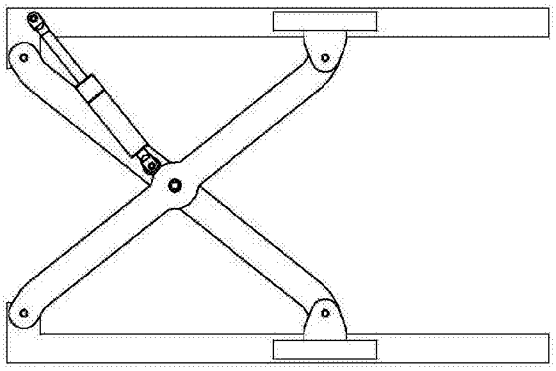


图 7

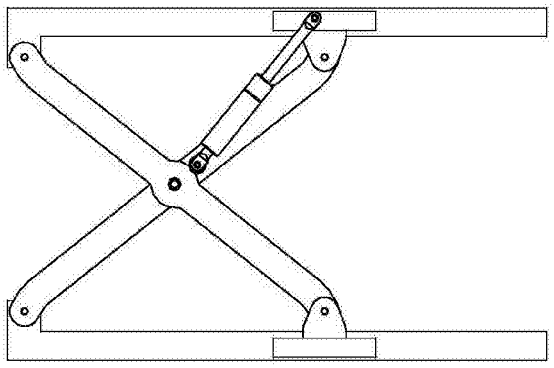


图 8

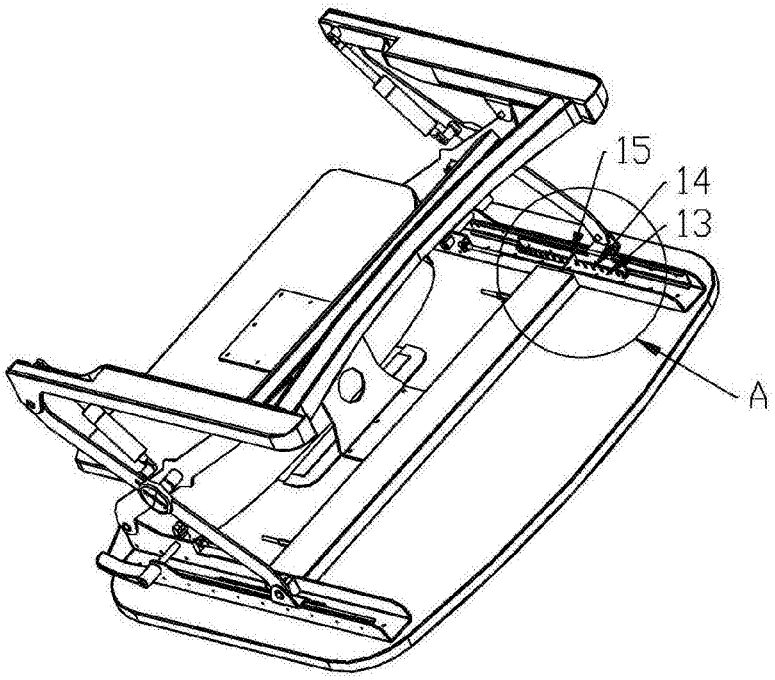


图 9

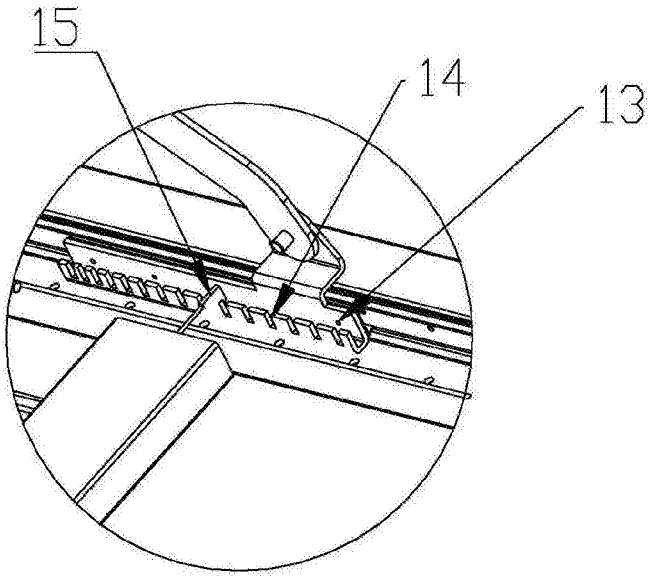


图 10

PE2E SEARCH - Search History (Prior Art)

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L14	78	("0226053" | "4403680" | "4515086" | "4926760" | "5632209" | "5829948" | "6038986" | "6112858" | "6286812" | "6397763" | "6585214" | "6679479" | "6705238" | "6857493" | "7677518" | "7950338"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/23 08:00 AM

		| "8015638" | "8424883" | "8469152" | "9055810" | "9133976" | "20040040480" | "20070034125" | "20130145972" | "20150289641").pn. OR ("9504316").urpn. AND (PGPB | USPT | USOC).dbnm.					
L15	34	(Artificial Intelligence) More like doc: US-9504316-B1 Text: (WO-2017184206-A1 OR US-10568416-B1 OR US-9681746-B1 OR US-10327544-B2 OR US-20180140089-A1 OR US-20190021487-A1 OR US-9961991-B1 OR US-20200367644-A1 OR US-20200000219-A1 OR US-10111518-B2 OR US-10485336-B1 OR US-20170354245-A1 OR US-20220125195-A1 OR US-20130014674-A1 OR US-10413055-B2 OR US-20190335898-A1 OR US-20180008037-A1 OR TW-M516896-U OR TW-M568641-U OR CN-206499122-U).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/23 08:06 AM
L16	270	L7	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/23 08:10 AM
L17	2	("20180125227" OR "6857493").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/09/23 08:11 AM
L18	166	("0200057" OR "0606845" OR	(US-PGPUB; USPAT)	OR	ON	ON	2022/09/23 08:13 AM

		"0835247" OR "1217772" OR "2692807" OR "3444830" OR "4072288" OR "4433759" OR "4558648" OR "9113703" OR "20180125227" OR "6857493" OR "10018298" OR "10023355" OR "10114352" OR "10123613" OR "10244861" OR "10258148" OR "10258149" OR "10264877" OR "10306977" OR "10413055" OR "10499730" OR "10517390" OR "10524565" OR "10542817" OR "10544019" OR "10568416" OR "10575630" OR "10869549" OR "10893748" OR "11083282" OR "11134773" OR "11134774" OR "11140977" OR "11147366" OR "11160367" OR "1318564" OR "20030042380" OR "20030213415" OR "20050120922" OR "20070001077" OR "20070080564" OR "20070266912" OR "20080000393" OR "20090145336" OR "20100242174" OR "20120097822" OR "20120188302" OR "20130193392" OR "20140144352" OR "20150028787" OR "20150216296" OR "20150289641" OR "20160249737" OR "20160338486" OR "20160353880" OR "20170071332" OR "20170196351" OR "20170354245" OR					

		"20180177289" OR "20180213929" OR "20180279770" OR "20190110588" OR "20190183239" OR "20190269237" OR "20200029685" OR "20200107633" OR "2843418" OR "2937003" OR "3295800" OR "3823915" OR "3826457" OR "4221280" OR "4448386" OR "4449262" OR "4549720" OR "4577821" OR "4625657" OR "4640488" OR "4659052" OR "4702454" OR "4709972" OR "4717112" OR "4741512" OR "4753419" OR "4826123" OR "4843978" OR "4941641" OR "4967672" OR "4995130" OR "5037163" OR "5048784" OR "5211367" OR "5251864" OR "5257767" OR "5294087" OR "5400720" OR "5588377" OR "5626323" OR "5722513" OR "5765797" OR "5829948" OR "5836562" OR "5926876" OR "5957426" OR "6076785" OR "6098961" OR "6148739" OR "6176456" OR "6179261" OR "6269753" OR "6273382" OR "6488248" OR "6516478" OR "6533229" OR "6533479" OR "6672430" OR					

		"6701853" OR "6702372" OR "6722618" OR "6742768" OR "6792876" OR "6938866" OR "7048236" OR "7188813" OR "7204193" OR "7207629" OR "7246784" OR "7575205" OR "7677518" OR "7841570" OR "7845665" OR "7946551" OR "7950338" OR "8015638" OR "8132518" OR "8303062" OR "8469152" OR "8490933" OR "8544391" OR "8671853" OR "8684339" OR "8931750" OR "8950343" OR "9049923" OR "9055810" OR "9232855" OR "9326598" OR "9480332" OR "9504316" OR "9554644" OR "9668572" OR "9681746" OR "9809136" OR "9815672" OR "9854904" OR "9955780" OR "9981571" OR "9993068" OR "D302893" OR "D830739" OR "D845037" OR "D854775" OR "D870490" OR "D901959").pn.					
L19	12	((("PONIATOWSKI") near3 ("Nathan"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/09/23 08:14 AM
L20	12	((("PONIATOWSKI") near3 ("Nathan"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/09/23 08:14 AM
L21	38	"6857493"	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/09/23 08:19 AM

L22	7	"105124920"	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/09/23 09:01 AM
L23	8	"204541230"	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/09/23 09:03 AM
L24	166	("0200057" OR "0606845" OR "0835247" OR "1217772" OR "2692807" OR "3444830" OR "4072288" OR "4433759" OR "4558648" OR "9113703" OR "20180125227" OR "6857493" OR "10018298" OR "10023355" OR "10114352" OR "10123613" OR "10244861" OR "10258148" OR "10258149" OR "10264877" OR "10306977" OR "10413055" OR "10499730" OR "10517390" OR "10524565" OR "10542817" OR "10544019" OR "10568416" OR "10575630" OR "10869549" OR "10893748" OR "11083282" OR "11134773" OR "11134774" OR "11140977" OR "11147366" OR "11160367" OR "1318564" OR "20030042380" OR "20030213415" OR "20050120922" OR "20070001077" OR "20070080564" OR "20070266912" OR "20080000393" OR "20090145336" OR "20100242174" OR "20120097822" OR "20120188302" OR "20130193392" OR "20140144352" OR	(US-PGPUB; USPAT)	OR	ON	ON	2022/09/23 11:21 AM

		"20150028787" OR "20150216296" OR "20150289641" OR "20160249737" OR "20160338486" OR "20160353880" OR "20170071332" OR "20170196351" OR "20170354245" OR "20180177289" OR "20180213929" OR "20180279770" OR "20190110588" OR "20190183239" OR "20190269237" OR "20200029685" OR "20200107633" OR "2843418" OR "2937003" OR "3295800" OR "3823915" OR "3826457" OR "4221280" OR "4448386" OR "4449262" OR "4549720" OR "4577821" OR "4625657" OR "4640488" OR "4659052" OR "4702454" OR "4709972" OR "4717112" OR "4741512" OR "4753419" OR "4826123" OR "4843978" OR "4941641" OR "4967672" OR "4995130" OR "5037163" OR "5048784" OR "5211367" OR "5251864" OR "5257767" OR "5294087" OR "5400720" OR "5588377" OR "5626323" OR "5722513" OR "5765797" OR "5829948" OR "5836562" OR "5926876" OR "5957426" OR "6076785" OR "6098961" OR "6148739" OR					

		"6176456" OR "6179261" OR "6269753" OR "6273382" OR "6488248" OR "6516478" OR "6533229" OR "6533479" OR "6672430" OR "6701853" OR "6702372" OR "6722618" OR "6742768" OR "6792876" OR "6938866" OR "7048236" OR "7188813" OR "7204193" OR "7207629" OR "7246784" OR "7575205" OR "7677518" OR "7841570" OR "7845665" OR "7946551" OR "7950338" OR "8015638" OR "8132518" OR "8303062" OR "8469152" OR "8490933" OR "8544391" OR "8671853" OR "8684339" OR "8931750" OR "8950343" OR "9049923" OR "9055810" OR "9232855" OR "9326598" OR "9480332" OR "9504316" OR "9554644" OR "9668572" OR "9681746" OR "9809136" OR "9815672" OR "9854904" OR "9955780" OR "9981571" OR "9993068" OR "D302893" OR "D830739" OR "D845037" OR "D854775" OR "D870490" OR "D901959").pn.					
L25	166	("0200057" OR	(US-PGPUB; USPAT)	OR	ON	ON	2022/09/23

		"0606845" OR "0835247" OR "1217772" OR "2692807" OR "3444830" OR "4072288" OR "4433759" OR "4558648" OR "9113703" OR "20180125227" OR "6857493" OR "10018298" OR "10023355" OR "10114352" OR "10123613" OR "10244861" OR "10258148" OR "10258149" OR "10264877" OR "10306977" OR "10413055" OR "10499730" OR "10517390" OR "10524565" OR "10542817" OR "10544019" OR "10568416" OR "10575630" OR "10869549" OR "10893748" OR "11083282" OR "11134773" OR "11134774" OR "11140977" OR "11147366" OR "11160367" OR "1318564" OR "20030042380" OR "20030213415" OR "20050120922" OR "20070001077" OR "20070080564" OR "20070266912" OR "20080000393" OR "20090145336" OR "20100242174" OR "20120097822" OR "20120188302" OR "20130193392" OR "20140144352" OR "20150028787" OR "20150216296" OR "20150289641" OR "20160249737" OR "20160338486" OR "20160353880" OR "20170071332" OR "20170196351" OR				12:02 PM

		"20170354245" OR "20180177289" OR "20180213929" OR "20180279770" OR "20190110588" OR "20190183239" OR "20190269237" OR "20200029685" OR "20200107633" OR "2843418" OR "2937003" OR "3295800" OR "3823915" OR "3826457" OR "4221280" OR "4448386" OR "4449262" OR "4549720" OR "4577821" OR "4625657" OR "4640488" OR "4659052" OR "4702454" OR "4709972" OR "4717112" OR "4741512" OR "4753419" OR "4826123" OR "4843978" OR "4941641" OR "4967672" OR "4995130" OR "5037163" OR "5048784" OR "5211367" OR "5251864" OR "5257767" OR "5294087" OR "5400720" OR "5588377" OR "5626323" OR "5722513" OR "5765797" OR "5829948" OR "5836562" OR "5926876" OR "5957426" OR "6076785" OR "6098961" OR "6148739" OR "6176456" OR "6179261" OR "6269753" OR "6273382" OR "6488248" OR "6516478" OR "6533229" OR "6533479" OR					

		"6672430" OR "6701853" OR "6702372" OR "6722618" OR "6742768" OR "6792876" OR "6938866" OR "7048236" OR "7188813" OR "7204193" OR "7207629" OR "7246784" OR "7575205" OR "7677518" OR "7841570" OR "7845665" OR "7946551" OR "7950338" OR "8015638" OR "8132518" OR "8303062" OR "8469152" OR "8490933" OR "8544391" OR "8671853" OR "8684339" OR "8931750" OR "8950343" OR "9049923" OR "9055810" OR "9232855" OR "9326598" OR "9480332" OR "9504316" OR "9554644" OR "9668572" OR "9681746" OR "9809136" OR "9815672" OR "9854904" OR "9955780" OR "9981571" OR "9993068" OR "D302893" OR "D830739" OR "D845037" OR "D854775" OR "D870490" OR "D901959").pn.					
L26	10	("0200057" OR "0606845" OR "0835247" OR "1217772" OR "2692807" OR "3444830" OR "4072288" OR "4433759" OR "4558648" OR	(US-PGPUB; USPAT)	OR	ON	ON	2022/09/23 12:03 PM

		"9113703").pn.					
L27	2503	(A47B9/16 OR A47B21/02 OR A47B21/0314 OR A47B21/04 OR A47B2021/0335).cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2022/09/23 03:18 PM
L28	25	("4558648" | "5588377" | "9504316" | "9999489" | "10028576" | "10264877" | "10869549" | "10893748" | "20030150657" | "20030189194" | "20090078509" | "20110240409" | "20150289641" | "20170295923" | "20170354245" | "20180055214" | "20180118538" | "20180125227" | "20180140089" | "20180146775" | "20180184797" | "20180192769" | "20180279770" | "20200029683" | "20200107633").pn. OR ("11337516").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/23 03:22 PM
L29	10	("10092089" | "10258148" | "11083282" | "20150250303" | "20160120300" | "20160249737" | "20170105518" | "20170354245" | "20180125227" | "20200029685").pn. OR ("11311100").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/23 03:27 PM
L30	87	("1318564" | "2937003" | "3295800" | "4221280" | "4558648" | "4577821" | "4843978" | "5037163" | "5211367" | "5257767" | "5588377" | "5626323" | "5829948" | "5957426" | "6076785" | "6098961" | "6269753" | "6516478" | "6533479" | "6701853" | "6722618" | "6742768" | "6792876" | "7677518"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/23 03:32 PM

		| "7841570" | "7950338" | "8132518" | "8544391" | "8671853" | "8684339" | "8931750" | "9049923" | "9326598" | "9480332" | "9504316" | "9554644" | "9681746" | "10159336" | "10244861" | "10258148" | "10258149" | "10499730" | "10542817" | "20030213415" | "20040040480" | "20070080564" | "20080000393" | "20120097822" | "20130193392" | "20130199420" | "20140144352" | "20140158026" | "20150232005" | "20150368082" | "20150375896" | "20160051042" | "20160106205" | "20160170402" | "20160260019" | "20160309889" | "20160338486" | "20160353880" | "20170174486" | "20170360192" | "20180008037" | "20180125227" | "20180177289" | "20180279770" | "20180360208" | "20190110588" | "20190269237" | "20200029685").pn. OR ("10893748").urpn. AND (PGPB | USPT | USOC).dbnm.					
L31	14479	(A47B9/16 OR A47B21/02 OR A47B21/0314 OR A47B21/04 OR A47B2021/0335).cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/23 03:39 PM
L32	1265	(A47B9/16 OR A47B21/02 OR A47B21/0314 OR A47B21/04 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR,	OR	ON	ON	2022/09/23 03:39 PM

		A47B2021/0335).cpc. AND (gas OR pneumatic)	GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L33	10	("0200057" OR "0606845" OR "0835247" OR "1217772" OR "2692807" OR "3444830" OR "4072288" OR "4433759" OR "4558648" OR "9113703").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/09/23 03:40 PM
L34	155	("10018298" OR "10023355" OR "10114352" OR "10123613" OR "10244861" OR "10258148" OR "10258149" OR "10264877" OR "10306977" OR "10413055" OR "10499730" OR "10517390" OR "10524565" OR "10542817" OR "10544019" OR "10568416" OR "10575630" OR "10869549" OR "10893748" OR "11083282" OR "11134773" OR "11134774" OR "11140977" OR "11147366" OR "11160367" OR "1318564" OR "20030042380" OR "20030213415" OR "20050120922" OR "20070001077" OR "20070080564" OR "20070266912" OR "20080000393" OR "20090145336" OR "20100242174" OR "20120097822" OR "20120188302" OR "20130193392" OR "20140144352" OR "20150028787" OR "20150216296" OR "20150289641" OR "20160249737" OR	(US-PGPUB; USPAT)	OR	ON	ON	2022/09/23 03:40 PM

		"20160338486" OR "20160353880" OR "20170071332" OR "20170196351" OR "20170354245" OR "20180177289" OR "20180213929" OR "20180279770" OR "20190110588" OR "20190183239" OR "20190269237" OR "20200029685" OR "20200107633" OR "2843418" OR "2937003" OR "3295800" OR "3823915" OR "3826457" OR "4221280" OR "4448386" OR "4449262" OR "4549720" OR "4558648" OR "4577821" OR "4625657" OR "4640488" OR "4659052" OR "4702454" OR "4709972" OR "4717112" OR "4741512" OR "4753419" OR "4826123" OR "4843978" OR "4941641" OR "4967672" OR "4995130" OR "5037163" OR "5048784" OR "5211367" OR "5251864" OR "5257767" OR "5294087" OR "5400720" OR "5588377" OR "5626323" OR "5722513" OR "5765797" OR "5829948" OR "5836562" OR "5926876" OR "5957426" OR "6076785" OR "6098961" OR "6148739" OR "6176456" OR "6179261" OR "6269753" OR					

		"6273382" OR "6488248" OR "6516478" OR "6533229" OR "6533479" OR "6672430" OR "6701853" OR "6702372" OR "6722618" OR "6742768" OR "6792876" OR "6938866" OR "7048236" OR "7188813" OR "7204193" OR "7207629" OR "7246784" OR "7575205" OR "7677518" OR "7841570" OR "7845665" OR "7946551" OR "7950338" OR "8015638" OR "8132518" OR "8303062" OR "8469152" OR "8490933" OR "8544391" OR "8671853" OR "8684339" OR "8931750" OR "8950343" OR "9049923" OR "9055810" OR "9232855" OR "9326598" OR "9480332" OR "9504316" OR "9554644" OR "9668572" OR "9681746" OR "9809136" OR "9815672" OR "9854904" OR "9955780" OR "9981571" OR "9993068" OR "D302893" OR "D830739" OR "D845037" OR "D854775" OR "D870490" OR "D901959").pn.					
L35	250	("20220186761" OR "0291032" OR "0634581" OR "0701000" OR	(US-PGPUB; USPAT)	OR	ON	ON	2022/09/23 03:40 PM

		"0861911" OR "0881673" OR "10034541" OR "10202996" OR "10378570" OR "10415613" OR "10448739" OR "10451097" OR "10486245" OR "10506875" OR "10544818" OR "10548397" OR "10669716" OR "10670064" OR "10724564" OR "10731688" OR "10736416" OR "10830266" OR "10830268" OR "10871179" OR "10876562" OR "10876563" OR "10968936" OR "11076691" OR "11083287" OR "11098484" OR "11137007" OR "11204051" OR "11246415" OR "11272783" OR "11326636" OR "1533099" OR "1534468" OR "1800386" OR "1800387" OR "1802245" OR "1954242" OR "20020170258" OR "20040165946" OR "20050042027" OR "20050104483" OR "20050236544" OR "20050247653" OR "20060091093" OR "20060101769" OR "20060180561" OR "20060236642" OR "20060273085" OR "20070006543" OR "20070028547" OR "20070193178" OR "20080010937" OR "20080066415" OR "20080193209" OR "20080216435" OR "20080236088" OR "20080244882" OR "20090014401" OR					

		"20090064624" OR "20100028592" OR "20100083603" OR "20100104354" OR "20100173122" OR "20100289389" OR "20110023303" OR "20110225921" OR "20110225922" OR "20110280655" OR "20110283650" OR "20120009383" OR "20120027967" OR "20120073235" OR "20120124932" OR "20120145845" OR "20120180416" OR "20120279161" OR "20120286637" OR "20130014463" OR "20130048632" OR "20130071172" OR "20130081349" OR "20130097846" OR "20130111845" OR "20130170904" OR "20130232905" OR "20130287484" OR "20140013919" OR "20140055018" OR "20140111076" OR "20140286701" OR "20140294498" OR "20150034522" OR "20150035422" OR "20150078807" OR "20150078819" OR "20150196118" OR "20150198191" OR "20150230600" OR "20150330088" OR "20150368896" OR "20160000220" OR "20160007751" OR "20160145029" OR "20160174704" OR "20160186925" OR "20160192775" OR "20160270531" OR "20170079433" OR "20170089379" OR "20170097033" OR "20170159291" OR "20170208938" OR "20170227031" OR "20170227032" OR "20170227035" OR "20170234346" OR					

		"20170298973" OR "20170360193" OR "20180080488" OR "20180087552" OR "20180112695" OR "20180119717" OR "20180202160" OR "20180283430" OR "20180328396" OR "20190113061" OR "20190166989" OR "20190191870" OR "20190195256" OR "20190289999" OR "20190320793" OR "20190323532" OR "20190323533" OR "20190323534" OR "20190323535" OR "20200003242" OR "20200055126" OR "20200069048" OR "20200069049" OR "20200102978" OR "20200121076" OR "20200214447" OR "20200300284" OR "20200337455" OR "20200340513" OR "20210079650" OR "20210148392" OR "20210180630" OR "20210190112" OR "20210207635" OR "20210222716" OR "20210262507" OR "20210262508" OR "20210276108" OR "20210285480" OR "20210381251" OR "20220018373" OR "20220049735" OR "2360451" OR "2362904" OR "2496184" OR "2681483" OR "3002630" OR "3195968" OR "3284152" OR "3313054" OR "3347610" OR "3410441" OR "3722704" OR "3722971" OR "3742807" OR "3765465" OR "3784271" OR "3884002" OR					

		"3885845" OR "3981118" OR "4089614" OR "4099293" OR "4099887" OR "4116510" OR "4142271" OR "4211379" OR "4222544" OR "4279397" OR "4299067" OR "4308961" OR "4324517" OR "4403886" OR "4405253" OR "4509648" OR "4593734" OR "4595105" OR "4597122" OR "4615448" OR "4629076" OR "4750794" OR "4752150" OR "4815908" OR "4817900" OR "4844266" OR "4883331" OR "4886326" OR "4888933" OR "4891897" OR "4909581" OR "4938625" OR "4944416" OR "4961295" OR "5004116" OR "5018323" OR "5109993" OR "5114265" OR "5121578" OR "5125518" OR "5138803" OR "5209556" OR "5212925" OR "5299509" OR "5360121" OR "5375802" OR "5423155" OR "5451102" OR "5458433" OR "5471804" OR "5475960" OR "5499667" OR "5499886" OR "5507331" OR "5527103" OR "5536108" OR "5658086" OR "5711115" OR					

		"5775521" OR "5810505" OR "5882098" OR "5893617" OR "5941026" OR "5944294" OR "5950389" OR "6045290" OR "6050426" OR "6142436" OR "6312186" OR "6349507" OR "6363645" OR "6413007").pn.					
L36	101	("0727192" | "0744613" | "0758431" | "1078759" | "1817418" | "2267973" | "2471901" | "2645538" | "2829863" | "3007676" | "3110476" | "3245366" | "3282566" | "3410328" | "3472183" | "3750846" | "3805712" | "4097941" | "4151804" | "4381714" | "4391345").pn. OR ("4558648").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/23 03:40 PM
L37	48	("2829863" | "2937852" | "3110476" | "3282566" | "3404791" | "4157743" | "4526346" | "4558648" | "4712653" | "4741512" | "4979592" | "5695173" | "5722513" | "6516478").pn. OR ("6672430").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/23 03:40 PM
L38	8	("3404791").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/23 03:40 PM
L39	39	(Artificial Intelligence) More like doc: US-3404791-A Text: (US-9150394-B2 OR US-20090301357-A1 OR US-20040000664-A1 OR US-6679479-B1 OR US-5782602-A OR US-5211265-A OR WO-9213671-A1 OR EP-0570397-A1 OR DE-4103993-A1 OR US-9932214-B1 OR EP-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT;	OR	ON	ON	2022/09/23 03:40 PM

		2354054-A1 OR US-9056730-B2 OR EP-2354054-B1 OR US-20110192871-A1 OR US-3891108-A OR US-20150368079-A1 OR US-3151754-A OR US-5538387-A OR RU-2763203-C1 OR US-2792134-A).did.	IBM_TDB)				
L40	37	("2766088" | "D716074" | "9326598" | "9504316" | "D781617" | "D781618" | "20030230222" | "20150289641" | "20170290413" | "20170354245" | "20180055214" | "20180125227").pn. OR ("D845037").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/23 03:40 PM
L41	34	("4515086" | "D365465" | "5490466" | "D771981" | "D771982" | "9504316" | "D781617" | "D781618" | "D784050" | "D785386" | "D814214" | "9961991" | "D830739" | "D832623" | "D836952" | "D837574" | "D841369" | "D843137" | "D845037" | "D845678" | "D867042" | "D870490" | "D870491" | "D878813" | "D885088" | "D885089" | "D901959" | "20170354245" | "20170360192" | "20180125227" | "20180177289" | "20180360208" | "20190110588").pn. OR ("D923989").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/23 03:40 PM
L42	78	("0226053" | "4403680" | "4515086" | "4926760" | "5632209" | "5829948" | "6038986" | "6112858" | "6286812" | "6397763" | "6585214" | "6679479" | "6705238" | "6857493" | "7677518" | "7950338"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/23 03:40 PM

		| "8015638" | "8424883" | "8469152" | "9055810" | "9133976" | "20040040480" | "20070034125" | "20130145972" | "20150289641").pn. OR ("9504316").urpn. AND (PGPB | USPT | USOC).dbnm.					
L43	34	(Artificial Intelligence) More like doc: US-9504316-B1 Text: (WO-2017184206-A1 OR US-10568416-B1 OR US-9681746-B1 OR US-10327544-B2 OR US-20180140089-A1 OR US-20190021487-A1 OR US-9961991-B1 OR US-20200367644-A1 OR US-20200000219-A1 OR US-10111518-B2 OR US-10485336-B1 OR US-20170354245-A1 OR US-20220125195-A1 OR US-20130014674-A1 OR US-10413055-B2 OR US-20190335898-A1 OR US-20180008037-A1 OR TW-M516896-U OR TW-M568641-U OR CN-206499122-U).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/23 03:40 PM
L44	270	L7	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/23 03:40 PM
L45	2	("20180125227" OR "6857493").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/09/23 03:40 PM
L46	166	("0200057" OR "0606845" OR	(US-PGPUB; USPAT)	OR	ON	ON	2022/09/23 03:40 PM

		"0835247" OR "1217772" OR "2692807" OR "3444830" OR "4072288" OR "4433759" OR "4558648" OR "9113703" OR "20180125227" OR "6857493" OR "10018298" OR "10023355" OR "10114352" OR "10123613" OR "10244861" OR "10258148" OR "10258149" OR "10264877" OR "10306977" OR "10413055" OR "10499730" OR "10517390" OR "10524565" OR "10542817" OR "10544019" OR "10568416" OR "10575630" OR "10869549" OR "10893748" OR "11083282" OR "11134773" OR "11134774" OR "11140977" OR "11147366" OR "11160367" OR "1318564" OR "20030042380" OR "20030213415" OR "20050120922" OR "20070001077" OR "20070080564" OR "20070266912" OR "20080000393" OR "20090145336" OR "20100242174" OR "20120097822" OR "20120188302" OR "20130193392" OR "20140144352" OR "20150028787" OR "20150216296" OR "20150289641" OR "20160249737" OR "20160338486" OR "20160353880" OR "20170071332" OR "20170196351" OR "20170354245" OR				

		"20180177289" OR "20180213929" OR "20180279770" OR "20190110588" OR "20190183239" OR "20190269237" OR "20200029685" OR "20200107633" OR "2843418" OR "2937003" OR "3295800" OR "3823915" OR "3826457" OR "4221280" OR "4448386" OR "4449262" OR "4549720" OR "4577821" OR "4625657" OR "4640488" OR "4659052" OR "4702454" OR "4709972" OR "4717112" OR "4741512" OR "4753419" OR "4826123" OR "4843978" OR "4941641" OR "4967672" OR "4995130" OR "5037163" OR "5048784" OR "5211367" OR "5251864" OR "5257767" OR "5294087" OR "5400720" OR "5588377" OR "5626323" OR "5722513" OR "5765797" OR "5829948" OR "5836562" OR "5926876" OR "5957426" OR "6076785" OR "6098961" OR "6148739" OR "6176456" OR "6179261" OR "6269753" OR "6273382" OR "6488248" OR "6516478" OR "6533229" OR "6533479" OR "6672430" OR					

		"6701853" OR "6702372" OR "6722618" OR "6742768" OR "6792876" OR "6938866" OR "7048236" OR "7188813" OR "7204193" OR "7207629" OR "7246784" OR "7575205" OR "7677518" OR "7841570" OR "7845665" OR "7946551" OR "7950338" OR "8015638" OR "8132518" OR "8303062" OR "8469152" OR "8490933" OR "8544391" OR "8671853" OR "8684339" OR "8931750" OR "8950343" OR "9049923" OR "9055810" OR "9232855" OR "9326598" OR "9480332" OR "9504316" OR "9554644" OR "9668572" OR "9681746" OR "9809136" OR "9815672" OR "9854904" OR "9955780" OR "9981571" OR "9993068" OR "D302893" OR "D830739" OR "D845037" OR "D854775" OR "D870490" OR "D901959").pn.					
L47	12	((("PONIATOWSKI") near3 ("Nathan"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/09/23 03:40 PM
L48	12	((("PONIATOWSKI") near3 ("Nathan"))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/09/23 03:40 PM
L49	38	"6857493"	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/09/23 03:40 PM

L50	7	"105124920"	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/09/23 03:40 PM
L51	8	"204541230"	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/09/23 03:40 PM
L52	166	("0200057" OR "0606845" OR "0835247" OR "1217772" OR "2692807" OR "3444830" OR "4072288" OR "4433759" OR "4558648" OR "9113703" OR "20180125227" OR "6857493" OR "10018298" OR "10023355" OR "10114352" OR "10123613" OR "10244861" OR "10258148" OR "10258149" OR "10264877" OR "10306977" OR "10413055" OR "10499730" OR "10517390" OR "10524565" OR "10542817" OR "10544019" OR "10568416" OR "10575630" OR "10869549" OR "10893748" OR "11083282" OR "11134773" OR "11134774" OR "11140977" OR "11147366" OR "11160367" OR "1318564" OR "20030042380" OR "20030213415" OR "20050120922" OR "20070001077" OR "20070080564" OR "20070266912" OR "20080000393" OR "20090145336" OR "20100242174" OR "20120097822" OR "20120188302" OR "20130193392" OR "20140144352" OR	(US-PGPUB; USPAT)	OR	ON	ON	2022/09/23 03:40 PM

		"20150028787" OR "20150216296" OR "20150289641" OR "20160249737" OR "20160338486" OR "20160353880" OR "20170071332" OR "20170196351" OR "20170354245" OR "20180177289" OR "20180213929" OR "20180279770" OR "20190110588" OR "20190183239" OR "20190269237" OR "20200029685" OR "20200107633" OR "2843418" OR "2937003" OR "3295800" OR "3823915" OR "3826457" OR "4221280" OR "4448386" OR "4449262" OR "4549720" OR "4577821" OR "4625657" OR "4640488" OR "4659052" OR "4702454" OR "4709972" OR "4717112" OR "4741512" OR "4753419" OR "4826123" OR "4843978" OR "4941641" OR "4967672" OR "4995130" OR "5037163" OR "5048784" OR "5211367" OR "5251864" OR "5257767" OR "5294087" OR "5400720" OR "5588377" OR "5626323" OR "5722513" OR "5765797" OR "5829948" OR "5836562" OR "5926876" OR "5957426" OR "6076785" OR "6098961" OR "6148739" OR					

		"6176456" OR "6179261" OR "6269753" OR "6273382" OR "6488248" OR "6516478" OR "6533229" OR "6533479" OR "6672430" OR "6701853" OR "6702372" OR "6722618" OR "6742768" OR "6792876" OR "6938866" OR "7048236" OR "7188813" OR "7204193" OR "7207629" OR "7246784" OR "7575205" OR "7677518" OR "7841570" OR "7845665" OR "7946551" OR "7950338" OR "8015638" OR "8132518" OR "8303062" OR "8469152" OR "8490933" OR "8544391" OR "8671853" OR "8684339" OR "8931750" OR "8950343" OR "9049923" OR "9055810" OR "9232855" OR "9326598" OR "9480332" OR "9504316" OR "9554644" OR "9668572" OR "9681746" OR "9809136" OR "9815672" OR "9854904" OR "9955780" OR "9981571" OR "9993068" OR "D302893" OR "D830739" OR "D845037" OR "D854775" OR "D870490" OR "D901959").pn.					
L53	166	("0200057" OR	(US-PGPUB; USPAT)	OR	ON	ON	2022/09/23

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		"20170354245" OR "20180177289" OR "20180213929" OR "20180279770" OR "20190110588" OR "20190183239" OR "20190269237" OR "20200029685" OR "20200107633" OR "2843418" OR "2937003" OR "3295800" OR "3823915" OR "3826457" OR "4221280" OR "4448386" OR "4449262" OR "4549720" OR "4577821" OR "4625657" OR "4640488" OR "4659052" OR "4702454" OR "4709972" OR "4717112" OR "4741512" OR "4753419" OR "4826123" OR "4843978" OR "4941641" OR "4967672" OR "4995130" OR "5037163" OR "5048784" OR "5211367" OR "5251864" OR "5257767" OR "5294087" OR "5400720" OR "5588377" OR "5626323" OR "5722513" OR "5765797" OR "5829948" OR "5836562" OR "5926876" OR "5957426" OR "6076785" OR "6098961" OR "6148739" OR "6176456" OR "6179261" OR "6269753" OR "6273382" OR "6488248" OR "6516478" OR "6533229" OR "6533479" OR					

		"6672430" OR "6701853" OR "6702372" OR "6722618" OR "6742768" OR "6792876" OR "6938866" OR "7048236" OR "7188813" OR "7204193" OR "7207629" OR "7246784" OR "7575205" OR "7677518" OR "7841570" OR "7845665" OR "7946551" OR "7950338" OR "8015638" OR "8132518" OR "8303062" OR "8469152" OR "8490933" OR "8544391" OR "8671853" OR "8684339" OR "8931750" OR "8950343" OR "9049923" OR "9055810" OR "9232855" OR "9326598" OR "9480332" OR "9504316" OR "9554644" OR "9668572" OR "9681746" OR "9809136" OR "9815672" OR "9854904" OR "9955780" OR "9981571" OR "9993068" OR "D302893" OR "D830739" OR "D845037" OR "D854775" OR "D870490" OR "D901959").pn.					
L54	10	("0200057" OR "0606845" OR "0835247" OR "1217772" OR "2692807" OR "3444830" OR "4072288" OR "4433759" OR "4558648" OR	(US-PGPUB; USPAT)	OR	ON	ON	2022/09/23 03:40 PM

		"9113703").pn.					
L55	2503	(A47B9/16 OR A47B21/02 OR A47B21/0314 OR A47B21/04 OR A47B2021/0335).cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2022/09/23 03:40 PM
L56	25	("4558648" | "5588377" | "9504316" | "9999489" | "10028576" | "10264877" | "10869549" | "10893748" | "20030150657" | "20030189194" | "20090078509" | "20110240409" | "20150289641" | "20170295923" | "20170354245" | "20180055214" | "20180118538" | "20180125227" | "20180140089" | "20180146775" | "20180184797" | "20180192769" | "20180279770" | "20200029683" | "20200107633").pn. OR ("11337516").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/23 03:40 PM
L57	10	("10092089" | "10258148" | "11083282" | "20150250303" | "20160120300" | "20160249737" | "20170105518" | "20170354245" | "20180125227" | "20200029685").pn. OR ("11311100").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/23 03:40 PM
L58	87	("1318564" | "2937003" | "3295800" | "4221280" | "4558648" | "4577821" | "4843978" | "5037163" | "5211367" | "5257767" | "5588377" | "5626323" | "5829948" | "5957426" | "6076785" | "6098961" | "6269753" | "6516478" | "6533479" | "6701853" | "6722618" | "6742768" | "6792876" | "7677518"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/23 03:40 PM

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L60	1265	(A47B9/16 OR A47B21/02 OR A47B21/0314 OR A47B21/04 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR,	OR	ON	ON	2022/09/23 03:40 PM

		A47B2021/0335).cpc. AND (gas OR pneumatic)	GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
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L63	49	(Artificial Intelligence) Similar to: Unpublished Application # Text: (US-11160367-B1 OR US-11134773-B1 OR US-11140977-B1 OR US-10575630-B1 OR US-11147366-B1 OR US-10244861-B1 OR US-10568416-B1 OR US-11388989-B1 OR US-11134774-B1 OR KR-20140098842-A OR CA-2814945-A1 OR EP-2685867-A1 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN))	OR	ON	ON	2022/09/23 04:00 PM

		WO-2013176690-A1 OR AU-2012381034-A1 OR US-8671853-B2 OR US-10893748-B1 OR CA-2814945-C OR US-20130139736-A1 OR US-20180177289-A1 OR US-9055810-B2 OR US-20150250303-A1 OR US-20130340655-A1 OR US-9554644-B2 OR US-9961991-B1 OR US-10092089-B1 OR US-20140158026-A1 OR US-20180132607-A1 OR US-20170095072-A1 OR US-20160150876-A1 OR ES-2698967-T3 OR US-9277809-B2 OR US-10413053-B2 OR AU-2012381034-B2 OR AU-2012381034-C1 OR US-9924793-B2 OR JP-3198070-U OR US-11395544-B1 OR US-20180360208-A1 OR US-10159336-B2 OR CN-107136750-A OR US-20180084903-A1 OR US-11019920-B2 OR CN-214855133-U OR US-11337516-B1 OR US-20170196351-A1 OR WO-2018057751-A1 OR US-20190110588-A1 OR US-10306977-B2 OR CN-108283365-A OR CN-101431916-A).did.					
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		OR KR-20170127387-A OR KR-20170127385-A OR KR-20160100206-A OR KR-20160100207-A OR DK-201970293-A1 OR EP-3966152-A1 OR WO-2020225743-A1 OR AU-2020268965-A1 OR CN-107257640-B OR WO-2018096447-A1 OR EP-3544564-A1).did.	JPO; DERWENT; IBM_TDB)				
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		U1 OR CN-208573202-U OR CN-202868238-U OR CN-108308852-A).did.					
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L70	10	((("PONIATOWSKI") near3 ("Nathan"))).INV. AND element.clm.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/09/24 12:21 PM
L71	46	"8015638"	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2022/09/24 12:32 PM
L72	61	"9302967"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/24 12:34 PM
L73	109	("20040040480"|"9055810"|"8671853"|"20090200437"|"6722618"|"9554644"|"1318564"|"20130145972"|"4843978"|"6269753"|"9326598"|"5626323"|"9504316"|"20030213415"|"20140144352"|"20040035332"|"20090090832"|"4577821"|"8132518"|"9480332"|"2	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/25 03:43 PM

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L76	482	108/145.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/26 10:23 AM
L77	3132	A47B3/00.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/26 10:25 AM
L78	1354	A47B9/00.cpc. AND spring	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU,	OR	ON	ON	2022/09/26 10:31 AM

			SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
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L80	54	(Artificial Intelligence) More like doc: CN-206079596-U Text: (CN-206079595-U OR WO-2018010262-A1 OR CN-207855329-U OR CN-203913893-U OR CN-213247481-U OR CN-105342138-A OR CN-105212523-B OR CN-113749390-B OR CN-113749390-A OR JP-3207307-U OR CN-204599795-U OR CN-201164195-Y OR CN-105901942-A OR CN-109497706-A OR CN-105212523-A OR CN-2110410-U OR CN-107212587-A OR CN-105342138-B OR CN-204949970-U OR CN-111671239-A).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/26 10:50 AM
L81	47	(Artificial Intelligence) More like doc: CN-107212587-A Text: (CN-107041626-B OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA,	OR	ON	ON	2022/09/26 10:51 AM

		WO-2018010262-A1 OR CN-206079596-U OR CN-107041632-A OR US-11147366-B1 OR CN-202407721-U OR US-11388991-B1 OR US-10893748-B1 OR US-11134773-B1 OR US-11140977-B1 OR US-10568416-B1 OR US-10244861-B1 OR US-11388989-B1 OR CN-201640949-U OR US-11134774-B1 OR WO-2016171511-A1 OR US-11160367-B1 OR CN-203966013-U OR US-10575630-B1 OR US-11395544-B1).did.	EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L82	56	"9815672"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/26 12:33 PM
L83	41	(Artificial Intelligence) More like doc: US-9815672-B2 Text: (US-20160060084-A1 OR EP-2994410-B1 OR DE-102013008020-A1 OR DE-102013008020-B4 OR EP-2994410-A1 OR WO-2014180572-A1 OR EP-3341319-B1 OR ES-2640757-T3 OR WO-2017036960-A1 OR DE-102015114408-A1 OR DE-102015114411-A1 OR DE-102015114411-B4 OR WO-2017036964-A1 OR EP-3341261-A1 OR EP-3826899-A1 OR US-4571139-A OR DE-19634711-A1 OR CN-215043005-U OR DE-19634711-C2 OR WO-2020033218-A1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/09/26 12:42 PM

PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.

Notice of References Cited	Application/Control No. 17/493,830	Applicant(s)/Patent Under Reexamination Poniatowski, Nathan Mark	
	Examiner JANET M WILKENS	Art Unit 3637	Page 1 of 1

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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
	A					
	B					
	C					
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	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N	105124920	12-2015	CN	Li et al	
	O	2014/180572	11-2014	WO	Baudermann	
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	English translation of CN105124920 (Year: 2015)
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-22)
Approved for use through 05/31/2024. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	17493830
Filing Date	2021-10-04
First Named Inventor	Nathan Mark Poniatowski
Art Unit	3637
Examiner Name	
Attorney Docket Number	1001-001US13

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	1217772	A	1917-02-27	Kade	
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17493830
	Filing Date	2021-10-04
	First Named Inventor	Nathan Mark Poniatowski
	Art Unit	3637
	Examiner Name	
	Attorney Docket Number	1001-001US13

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	1	201657970	CN	U	2010-12-01	黄议绪		☒
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Examiner Name	
Attorney Docket Number	1001-001US13

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Examiner Name	
Attorney Docket Number	1001-001US13

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Signature	/Daniel T. Lund/	Date (YYYY-MM-DD)	2022-08-31
Name/Print	Daniel T. Lund	Registration Number	58614

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(19) Weltorganisation für geistiges Eigentum
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— *mit internationalem Recherchenbericht (Artikel 21 Absatz V*

(54) **Title:** LOADING APPARATUS

(54) **Bezeichnung** : LADEVORRICHTUNG

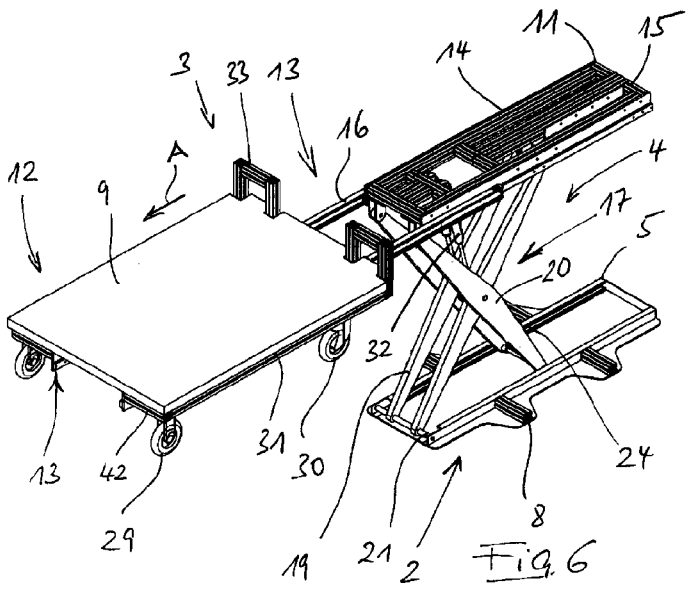


Fig. 6

(57) Abstract: A loading apparatus, in particular for conveying freight over a road surface and loading it into a transporting vehicle and unloading it therefrom, comprises a basic structure (2), a loading structure (3), with a freight holder, and a double-action lifting device (4) between the basic structure (2) and the loading structure (3). The loading structure (3) here comprises a lifting frame (11), on which the lifting device (4) acts, and a freight carrier (12), which is mounted on the lifting frame (11), via a pull-out guide (13) with a pull-out direction (A) oriented transversely to the lifting direction, and has the freight holder. An undercarriage serving for advancing the loading apparatus over the road surface is part of the freight carrier (12).

(57) Zusammenfassung: Eine Ladevorrichtung, insbesondere um Frachtgut auf einer Verkehrsfläche zu befördern und in ein Transportfahrzeug ein- bzw. aus diesem auszuladen, umfasst eine Basisstruktur (2), eine Ladestruktur (3) mit einer Frachtgutaufiiahme und eine zwischen der Basisstruktur (2) und der Ladestruktur (3) doppelt wirkende Hubeinrichtung (4). Dabei umfasst die Ladestruktur (3) einen Hubrahmen (11), an welchem die Hubeinrichtung (4) angreift, und einen Frachtgutträger (12), der an dem Hubrahmen (11) über eine Ausziehführung (13) mit einer quer zur Hubrichtung orientierten Ausziehrichtung (A) gelagert ist und die Frachtgutaufiiahme aufweist. Ein der Fortbewegung der Ladevorrichtung auf der Verkehrsfläche dienendes Fahrwerk ist Teil des Frachtgutträgers (12).

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Ladevorrichtung

Die vorliegende Erfindung betrifft eine Ladevorrichtung, geeignet insbesondere um Frachtgut auf einer Verkehrsfläche zu befördern und in ein Transportfahrzeug ein- bzw. aus diesem auszuladen, umfassend eine Basisstruktur, eine Ladestruktur mit einer Frachtgutaufnahme und eine zwischen der Basisstruktur und der Ladestruktur doppelt wirkende Hubeinrichtung.

Im Stand der Technik gibt es eine Reihe von Vorschlägen für Ladevorrichtungen der vorstehend angegebenen Art, welche übereinstimmend der Zielsetzung dienen, das Be- bzw. Entladen von Transport fahrzeugen mit Frachtgut zu erleichtern, damit dies - samt dem Befördern des Frachtguts auf einer Verkehrs fläche - möglichst durch eine einzige Person erledigt werden kann. Auf diese Weise soll beispielsweise der Personalaufwand beim Ausliefern von Frachtgut reduziert werden, indem ein Beifahrer, der ausschließlich kurzfristig beim Ladevorgang tätig wird, überflüssig wird. Indem die Hubeinrichtung doppelt -wirkend ausgeführt ist, kann sie nicht nur zum Anheben bzw. Absenken der Ladestruktur (samt dem geladenen Frachtgut) verwendet werden, sondern in gleicher Weise - bei auf die Ladefläche des Transportfahrzeugs aufgesetzter Ladestruktur - zum Anheben der Basisstruktur, um die Lade**Vorrichtung** auf der Ladefläche des Transportfahrzeugs verstauen zu können.

BESTÄTIGUNGSKOPIE

Repräsentiert wird der einschlägige Stand der Technik insbesondere durch Veröffentlichungen wie die FR 1506606, DE 2530634, US 4061237, WO 83/04226, US 4613272, WO 92/07746, EP 889000, US 2005/0042068 und CN 201896055 U.

Obwohl ersichtlich ein (zunehmender) Bedarf für Ladevorrichtungen der eingangs angegebenen Art besteht, konnten sich - mit einer Ausnahme - die diversen Vorschläge nicht in der Praxis etablieren. Und auch die - unter dem Handelsnamen "Innolift" - vertriebene Ladevorrichtung gemäß der WO 92/07746 bzw. der CN 201896055 U erfüllt die in sie gesetzten Erwartungen nicht.

Der vorliegenden Erfindung liegt die Aufgabe zugrunde, eine Ladevorrichtung der eingangs angegebenen Art bereitzustellen, die sich durch eine verbesserte Praxistauglichkeit auszeichnet.

Gelöst wird diese Aufgabenstellung gemäß der vorliegenden Erfindung, indem bei einer Ladevorrichtung der eingangs angegebenen Art die Ladestruktur einen Hubrahmen, an welchem die Hubeinrichtung angreift, und einen Frachtgutträger, der an dem Hubrahmen über eine Ausziehführung mit einer quer zur Hubrichtung orientierten Ausziehrichtung gelagert ist und die Frachtgutaufnähme aufweist, umfasst, wobei ein der Fortbewegung der Ladevorrichtung auf der Verkehrsfläche dienendes Fahrwerk Teil des Frachtgutträgers ist. In einer synergetischen funktionalen Wechselwirkung miteinander resultieren die

in Kombination miteinander für die erfindungsgemäße LadeVorrichtung bestimmenden Merkmale in einer Reihe gravierender praxisrelevanter Vorzüge, welche insbesondere die Einsatzmöglichkeiten der Ladevorrichtung substantiell erweitern, deren Handhabung erleichtern und die Sicherheit um ein entscheidendes Maß erhöhen, wobei zugleich eine all diese Vorzüge aufweisende Ladevorrichtung konstruktiv vergleichsweise einfach - und somit zuverlässig - sowie leicht und kompakt ausgeführt sein kann. Gerade im Hinblick auf die Sicherheit ist - im Zusammenwirken mit den übrigen für die erfindungsgemäße Ladevorrichtung charakteristischen Merkmalen - verantwortlich, dass die Ladestruktur in dem Sinne mehrteilig aufgebaut ist, dass die Frachtgutaufnahme an einem Frachtgutträger angeordnet ist, welcher über eine Ausziehführung an einem Hubrahmen gelagert ist, an welchem wiederum die - das Heben und Senken der Ladestruktur bei auf der Verkehrs fläche aufstehender Basiseinheit bewirkende - Hubeinrichtung angreift . Denn auf diese Weise kann das Frachtgut ohne gleichzeitige Bewegung der Basisstruktur relativ zu der Verkehrsfläche (Ausgangsfläche) in den Laderaum bzw. auf die Ladefläche (Zielfläche) des Transport fahrzeugs verschoben werden. Weder beim Beladen des Transport fahrzeugs mit dem Frachtgut, noch beim Entladen des Frachtguts aus dem Transport fahrzeug muss bei angehobener Last bzw. angehobenem Frachtgut die LadeVorrichtung, d.h. deren Basisstruktur auf der Verkehrs fläche verfahren werden. Dies ist gerade im Hinblick auf Anwendungen, bei denen eine vergleichsweise unebene Verkehrs fläche bzw. ein

vergleichsweise unebener sonstiger Untergrund existiert (beispielsweise beim Baustellenbetrieb) ein unschätzbarer Vorteil, weil ein solcher unebener Untergrund bei Verwendung von bekannten (insbesondere mit schwerer Fracht beladenen) LadeVorrichtungen deren Verfahren erheblich erschwert und darüber hinaus insbesondere bei einem Verfahren der Ladevorrichtung mit angehobener Last wegen einer Kippgefahr ein erhebliches Sicherheitsrisiko darstellt. Anders, als dies für jenen Stand der Technik (US 4613272, WO 92/07746 und CN 201896055 U) gilt, bei welchem die Basisstruktur ein Stück weit unter das Transportfahrzeug geschoben wird, lässt sich die erfindungsgemäße Ladevorrichtung auch in der (oft tatsächlich vorliegenden) Situation einsetzen, dass das Transportfahrzeug an eine Bordsteinkante herangefahren wird, und zwar typischerweise so weit, dass sich diese etwa unter der Ladekante befindet. Auch ist der Arbeitsablauf, wie er in Anwendung der Erfindung möglich ist, homogener und durch weniger Unterbrechungen geprägt, als dies für den Stand der Technik (insbesondere unter Verwendung von Ladevorrichtungen nach der WO 92/07746 und der CN 201896055 U) gilt, nämlich insbesondere in Anbetracht dessen, dass die Ladevorrichtung nach dem Aufladen typischerweise noch auf der Ladefläche des Transport fahrzeugs rangiert wird. Hierfür ist nach dem Stand der Technik erforderlich, die Last - durch teilweises Anheben der Ladestruktur - erneut auf die das Fahrwerk aufweisende Basisstruktur zu übergeben, wohingegen bei erfindungsgemäßen Ladevorrichtungen die Last sogleich auf das an dem Frachtgutträger ange-

ordnete Fahrwerk abgesetzt wird (insbesondere auf Räder, die zusammen mit den lasttragenden strukturellen Bereichen des Frachtgut trägers Teil des der Fortbewegung der Ladevorrichtung dienenden Fahrwerks sind) . Eine Reihe weiterer Vorteile werden aus der nachfolgenden detaillierten Erläuterung der vorliegenden Erfindung und spezifischer bevorzugter Weiterbindungen ersichtlich.

Die vorstehenden - wie auch die noch folgenden - Erläuterungen der vorliegenden Erfindung zeigen, dass die die erfindungsgemäße Ladevorrichtung definierenden Merkmale, soweit nichts anderes angegeben ist, breit zu verstehen sind. So kann die Basisstruktur jede beliebige konstruktive und statische Gestalt aufweisen, mittels derer sich die maßgebliche Funktion, die Hubstruktur auf der Verkehrs fläche abzustützen, erfüllen lässt. Als Hubeinrichtung ist wiederum jede Einrichtung geeignet, mittels derer sich, bei auf der Verkehrsfläche abgestützter Basisstruktur die Ladestruktur anheben (und absenken) und bei fixierter, d.h. beispielsweise auf der Ladefläche eines Transport fahr - zeugs abgestützter Ladestruktur die Basisstruktur anheben (und absenken) lässt. Ebenfalls ist der Begriff der "Verkehrsf läche" weit auszulegen und beinhaltet jeden tragfähigen, d.h. begehbaren bzw. befahrbaren Untergrund. Weiterhin ist unter "Hubrahmen" jede Struktur zu verstehen, die geeignet ist, mit der Hubeinrichtung verbunden zu werden und die von dem Frachtgut träger (samt aufgenommenem Frachtgut) über die Ausziehf ührung

auf den Hubrahmen übertragenen Kräfte in die Hubeinrichtung einzuleiten. Auch hinsichtlich der "Ausziehführung" existieren keine konstruktiven Beschränkungen; vielmehr kann eine solche "Ausziehführung" durch jede im Wesentlichen linear längenveränderbare Struktur realisiert werden, die imstande ist, quer zur Ausziehrichtung Kräfte zu übertragen. Auch die Angabe, wonach die Ausziehrichtung "quer" zur Hubrichtung orientiert wird, besagt im weitesten Sinne nicht mehr, als dass die Ausziehrichtung mehr oder weniger rechtwinklig zur Hubrichtung orientiert ist, also insbesondere bei einer mehr oder weniger vertikalen Hubrichtung mehr oder weniger horizontal.

Auch und gerade hinsichtlich des "Fahrwerks" gibt es kaum konstruktive Einschränkungen. Während sich die vorliegende Erfindung für die meisten Anwendungen mit Vorteil mit Räderfahrwerken realisieren lässt, welche bevorzugt vier Räder aufweisen, so ist dies keinesfalls zwingend. Andere geeignete Fahrwerke, die für bestimmte Anwendungen mit Vorteil einsetzbar sind, sind beispielsweise Raupenfahrwerke, Kufenfahrwerke, Luftkissenfahrwerke, Magnetschwebefahrwerke und dergleichen. Entscheidend ist allein, dass eine Fortbewegung auf festen Untergrund wie der Verkehrsfläche und/oder der Ladefläche eines Transportfahrzeugs möglich ist. Wenn im Folgenden die vorliegende Erfindung anhand einer Ausführungsvariante erläutert wird, bei der das Fahrwerk als Räderfahrwerk ausgebildet ist, so dient dies allein der Erleichterung des Verständnisses, ohne dass

hiermit eine Beschränkung auf Räderfahrwerke verbunden wäre. Die aufgezeigten Gesichtspunkte gelten, sofern sich nichts anderes ergibt, in gleicher Weise für andere Fahrwerkstypen.

Gemäß einer ersten bevorzugten Weiterbildung der Erfindung umfasst das - einen Teil der Frachtgutaufnahme bildende - Fahrwerk (vorzugsweise vier) Räder, welche besonders bevorzugt randseitig an dem Frachtgutträger angeordnet sind, und zwar idealerweise direkt unter den seitlichen Begrenzungen des Frachtgutträgers bzw. unmittelbar außerhalb neben diesen. So ergibt sich eine große Spurweite des Fahrwerks, was einen bedeutenden sicherheitsrelevanten Aspekt darstellt. Zudem lassen sich insbesondere in diesem Falle Räder mit einem vergleichsweise großem Durchmesser einsetzen, was die Handhabung erleichtert und - wiederum im Hinblick auf die Verwendung der Ladevorrichtung auf einem unebenen Untergrund - ebenfalls ein sicherheitsrelevanter Aspekt ist. Im Interesse einer guten Handhabbarkeit ist bevorzugt mindestens ein Teil der Räder lenkbar, d.h. die betreffenden Räder sind z.B. als Lenkrollen (ggf. feststellbar für Geradeausfahrt) ausgeführt; dies erleichtert das Manövrieren der Ladevorrichtung auf der Verkehrsfläche und/oder der Ladefläche des Transport - fahrzeugs. Zudem ist bevorzugt zumindest ein Teil der Räder mit Bremsen ausgestattet, die beispielsweise beim Ladevorgang dann angezogen werden, wenn der Frachtgutträger auf der Ladefläche des Transportfahrzeugs abgesetzt wurde und - unter Verwendung der Hubeinrichtung -

die Basisstruktur anzuheben ist, um anschließend wieder unter die Ladestruktur geschoben zu werden. (Im Hinblick auf die Möglichkeit, die Hubeinrichtung raumsparend möglichst flach unter der Ladestruktur unterzubringen, ist die weiter unten eingehend erläuterte Verwendung eines Scherenhebers besonders zu bevorzugen.) Für die Handhabung der Ladevorrichtung ist dabei günstig, wenn die Bremsen fernbetätigbar sind, beispielsweise von einer am rückwärtigen Ende der Ladevorrichtung angeordneten, mit entsprechenden Bedienelementen ausgestatteten Handhabe aus .

Nachdem die Basisstruktur bei angehobener Last nicht auf dem Untergrund bewegt zu werden braucht, wird sich typischerweise eine hinreichende Kippsicherheit mit einer Basisstruktur erzielen lassen, die sich seitwärts nicht über die Spurbreite der Räder hinaus erstreckt . Dies ermöglicht einen kompakten Aufbau der Ladevorrichtung, wobei im Allgemeinen die Basisstruktur sogar vollständig in dem Zwischenraum zwischen den Rädern Platz findet. Sie kann allerdings auch auf der der Ausziehrichtung entgegen gesetzten Seite Stützfüße aufweisen, deren Ausladung im Wesentlichen der Spur der Räder entspricht. Für extreme Einsätze kommt, gemäß einer abermals anderen Weiterbildung der Erfindung, auch in Betracht, die Basisstruktur mit ausfahrbaren, ausziehbaren und ausklappbaren Stützfüßen auszustatten, um die Standsicherheit nochmals zu steigern.

Nachdem das zum Befördern der Ladevorrichtung (ggfs. samt aufgenommenem Frachtgut) auf der Verkehrs fläche geeignete Fahrwerk Teil des Frachtgutträgers ist, brauchen an der Basisstruktur keine Räder angeordnet zu sein. Dies spart Gewicht und ist unter statischen Gesichtspunkten von großem Vorteil. Absolut zwingend ist die Abwesenheit von Rädern bzw. Rollen an der Basis - struktur indessen nicht. So können beispielsweise (kleine) Rollen vorgesehen sein, welche allein dazu dienen, beim Verfahren der Ladevorrichtung auf der Verkehrsfläche das Gewicht der Basisstruktur zu stützen, so dass diese nicht von der Hubeinrichtung angehoben zu werden braucht .

Gemäß einer abermals anderen bevorzugten Weiterbildung der vorliegenden Erfindung umfasst die Hubeinrichtung einen Scherenheber. Dies ist günstig im Hinblick auf die Kinematik als auch im Hinblick auf die Statik sowie die Möglichkeit, die erfindungsgemäße Ladevorrichtung äußerst kompakt und leicht auszuführen. Namentlich lässt sich im Falle der Verwendung eines Scherenhebers als Teil der Hubeinrichtung letztere besonders flach und raumsparend zusammenlegen, so dass sie in dieser Konfiguration unter der Ladestruktur untergebracht werden kann. Mit insoweit besonderem Vorteil ist dabei mindestens einer der Lenker des Scherenhebers gekröpft ausgeführt und/oder greift ein Antriebselement versetzt zum Gelenkpunkt des Scherenhebers an einem der Lenker an, was die Bereitstellung ausreichend hoher Hubkräfte bei - bei abgesenkter Ladestruktur - besonders flachen

Scherenhebern ermöglicht. Im Sinne günstiger kinematischer Verhältnisse ist die in Ausziehrichtung (der Frachtgutaufnähme) gelegene Lagerung des Scherenhebers an der Basisstruktur besonders bevorzugt als Festlager ausgeführt; d.h. die der Ausziehrichtung entgegengesetzt gelegene Lagerung des Scherenhebers an der Basisstruktur ist als Loslager (mit in mindestens einer Linearführung geführtem Stützelement) ausgeführt.

Eine andere bevorzugte Weiterbildung der vorliegenden Erfindung zeichnet sich dadurch aus, dass die Hubeinrichtung eine elektrische oder eine elektro-hydraulische Antriebseinheit umfasst. Dies ermöglicht kompakte und gleichwohl sehr leistungsfähige Ladevorrichtungen, wobei namentlich bei größeren, zum Heben besonders schwerer Frachtgüter bestimmten Ladevorrichtungen der Einsatz elektro-hydraulischer Antriebseinheiten für die Hubeinrichtungen besonders vorteilhaft ist. Eine insoweit vorgesehene elektrische Speichereinheit der Antriebseinheit ist besonders bevorzugt an der Ladestruktur angeordnet, und zwar besonders bevorzugt am Hubrahmen an dessen in Ausziehrichtung vorne liegender Frontseite. Dies trägt, ohne dass eine (bei Anordnung der Speichereinheit an dem Frachtgutträger erforderliche) aufwändige Verlegung von elektrischen Leitungen notwendig ist, zu einer vergleichsweise günstigen Gewichtsverteilung bei, insbesondere im Hinblick auf die Phase des Anhebens bzw. Absenkens der Basisstruktur bei auf die Ladefläche des Transportfahrzeugs aufgesetztem Frachtgutträger. Wenn dabei die elektri-

sehe Speichereinheit einen Ladeanschluss aufweist, welcher an die elektrische Anlage eines (als Kraftfahrzeugs ausgeführten) Transport fahrzeugs anschließbar ist, so genügt für typische Anwendungen eine vergleichsweise kleine elektrische Speichereinheit. Dies ist vorteilhaft im Hinblick auf Kosten, Gewicht und Baugröße der Ladevorrichtung. Günstig ist auch, die elektrische Speichereinheit der Antriebseinheit als Wechselakku auszuführen. Dies gestattet die sehr kleinformatige Ausführung der Speichereinheit, damit diese in eine vergleichsweise kompakte Ladevorrichtung passt, ohne dass die Nutzungsmöglichkeiten der Ladevorrichtung hierdurch beschränkt würden. Ein der Ladevorrichtung entnommener Wechselakku kann an der elektrischen Anlage eines Transport fahrzeuges aufgeladen werden.

Eine weitere Antriebseinheit bewirkt in einer abermals anderen bevorzugten Weiterbildung der vorliegenden Erfindung das Ausfahren und Einfahren des Frachtgutträgers relativ zum Hubrahmen. Ein solcher Ausfahrantrieb kann beispielsweise elektrisch ausgeführt sein. Ebenfalls könnte ein solcher Ausfahrantrieb beispielsweise einen Hydraulikzylinder umfassen, der von dem Hydraulikaggregat der elektro-hydraulischen Antriebseinheit der Hubeinrichtung versorgt wird. Unter Aspekten der Betriebssicherheit ist vorteilhaft, wenn auf den Ausfahrantrieb eine Steuerung einwirkt, welche die Ausfahrbewegung unter Berücksichtigung von sicherheitsrelevanten Kenngrößen steuert . So kann in der Steuerung beispielsweise das Signal mindestens eines an dem

Frachtgutträger, bevorzugt im Bereich frontseitiger Räder, angeordneten, der Erfassung der Position des Frachtgutträgers relativ zu einer Ladefläche dienenden Sensors dergestalt verarbeitet werden, dass das (über einen festgesetzten Ausfahrweg von beispielsweise 400mm fortgesetzte) Ausfahren des Frachtgutträgers unterbunden wird, wenn sich das Fahrwerk nicht zumindest teilweise über einer Ladefläche befindet. Auch die Höhe des Fahrwerks des Frachtgut trägers oberhalb der Ladefläche kann in der Steuerung dergestalt berücksichtigt werden, dass ein (weiteres) Ausfahren des Frachtgutträgers unterbunden wird, wenn sich das Fahrwerk in einer oberhalb eines zulässigen Werts liegenden Höhe über einer Ladefläche befindet. Weiterhin können in der Steuerung des Ausfahrantriebs Signale von Lastsensoren, welche Stützfüßen der Basisstruktur und/oder Rädern des Fahrwerks zugeordnet sind, in dem Sinne ausgewertet werden, dass ein (weiteres) Ausfahren des Frachtgutträgers unterbleibt, wenn eine auf eine zunehmende Kippgefahr hindeutende Belastungssituation ermittelt wird. Die besagten sicherheitsrelevanten Kenngrößen können zusätzlich (oder alternativ) auch für die Erzeugung einer Benachrichtigung bzw. Warnung verwendet werden.

Unter statischen Gesichtspunkten kann es günstig sein, wenn die Basisstruktur zu ihrer Abstützung auf der Verkehrsfläche eine vergleichsweise große, durchgehende Auflagefläche aufweist. Umgekehrt kann es indessen für bestimmte Anwendungen auch vorteilhaft sein, an der Basisstruktur ausgeprägte Stützfüße anzuordnen. Dies

gilt namentlich dann, wenn zumindest einem Stützfuß ein Lastsensor (s.o.) zugeordnet wird, der die Last Situation überwacht und beispielsweise ein Signal auslöst, wenn sich die Lastverteilung einem im Hinblick auf die Standsicherheit kritischen Punkt annähert. Derartige Lastsensoren können mit dem gleichen Vorteil auch mindestens einem der an dem Frachtgutträger angeordneten Räder zugeordnet sein.

Der Frachtgutträger und der Hubrahmen sind besonders bevorzugt relativ zueinander verriegelbar. Und die Hubeinrichtung ist bevorzugt in einer teilweise angehobenen Stellung der Ladestruktur sperrbar. Dies ermöglicht es, für die Fahrt des Transportfahrzeuges die Ladevorrichtung auf der Ladefläche dadurch zu sichern, dass die Ladestruktur mittels der Hubeinrichtung so weit angehoben wird, dass die an dem Frachtgutträger angeordneten Räder von der Ladefläche abgehoben werden, wobei zudem über die Verriegelung des Frachtgutträgers relativ zum Hubrahmen die Lage des Frachtgutträgers und somit des Frachtguts relativ zur Basisstruktur gesichert wird. Vorteilhafterweise ist dabei, beispielsweise über einen entsprechende Einstellung in einer Steuerung der Ladevorrichtung, eine solche (teilweise angehobene) Stellung der Hubeinrichtung fest vorgegebenen, in der das Fahrwerk des Frachtgut trägers gerade außer Kontakt mit dem Untergrund gebracht wird, so dass sich das gesamte Gewicht von Ladevorrichtung und Last - bei möglichst niedrigem Schwerpunkt - ausschließlich über die Basisstruktur auf dem Untergrund abstützt. Zur

Sicherung des Frachtguts an bzw. auf dem Frachtgut träger weist Letzterer bevorzugt zur Anbringung von Befestigungs- und/oder Sicherungsmitteln für das Frachtgut geeignete Halterungen auf, beispielsweise Ösen, Bohrungen, Durchbrüche oder Haken.

Für die Bedienung der Ladevorrichtung samt deren Rangieren bzw. Manövrieren sowie die Betätigung vorgesehener Antriebe weist die Ladevorrichtung bevorzugt an ihrem rückwärtigen, der Ausziehrichtung entgegengesetzten Ende eine Handhabe auf, die mit entsprechenden, der Betätigung der Antriebe dienenden Bedienelementen ausgestattet ist. Bevorzugt ist eine solche Handhabe an der Basisstruktur oder dem Hubrahmen angeordnet . Die Anordnung und Ausgestaltung der Handhabe erfolgt dabei bevorzugt dergestalt, dass sie weder ein (vorzugsweise vollständiges) Unterschieben der Basisstruktur unter die Ladestruktur behindert, noch ständig nennenswert über die Minimalkontur der Hauptkomponenten des Ladegeräts (bei abgesenkter Ladestruktur und eingefahrenem Frachtgutträger) übersteht. In diesem Sinne kann die Handhabe beispielsweise gelenkig schwenk- bzw. klappbar und/oder einschiebbar an der Basisstruktur oder am Hubrahmen angebracht sein. Die Handhabe und/oder ihre Anbringung an der Basisstruktur bzw. dem Hubrahmen ist dabei vorzugsweise so ausgeführt, dass an ihr angeordnete Griffe auch bei einer bestimmungsgemäß beim Betrieb des Ladevorrichtung erfolgenden Veränderung der Höhe von Basisstruktur bzw. Hubrahmen über dem Untergrund ihre eigene Höhe nicht oder nur geringfügig ver-

ändern. Vor dem gleichen Hintergrund ist, gemäß einer anderen bevorzugten Weiterbildung, besonders vorteilhaft, wenn die Handhabe eine ausfahrbare, z.B. teleskopische verlänger- bzw. verkürzbare Deichsel aufweist; denn dies erleichtert die Bedienung der LadeVorrichtung bei ihrer bestimmungsgemäßen Verwendung, während derer sich die Höhe des Hubrahmens und der Basisstruktur über der Verkehrs fläche ändert. Besonders komfortabel ist es, wenn die Länge der Deichsel mittels eines Längenverstellantriebs veränderbar ist. Dieser kann, im Interesse einer weiter gesteigerten Bedienfreundlichkeit, mit dem Hubantrieb phasenweise in dem Sinne koppelbar sein, dass sich die Länge der Deichsel automatisch verkürzt, wenn die Komponente (Basisstruktur oder Hubrahmen) , an der sie angebracht ist, mittels der Hubeinrichtung angehoben wird. Im Falle der Anbringung der Deichsel an dem Hubrahmen ist hierfür eine (phasenweise) inverse Koppelung des Längenvers tellantriebs der Deichsel mit dem Antrieb der Hubeinrichtung vorzusehen. Unter ergonomischen Gesichtspunkten ist im Übrigen vorteilhaft, wenn die Ausfahrrichtung der Deichsel schräg zur Hubrichtung orientiert, d.h. insbesondere leicht nach hinten geneigt ist.

Für eine möglichst vielfältige Nutzbarkeit der erfindungsgemäßen Ladevorrichtung weist bei dieser, gemäß einer abermals anderen bevorzugten Weiterbildung, der Frachtgutträger einen austauschbaren, funktions- bzw. anwendungsspezifischen Aufsatz auf. Ein solcher Aufsatz kann beispielsweise eine (ebene) Ladeplattform, eine

Schüttgutaufnahme oder eine Spezialhalterung (z.B. für eine Kabeltrommel) umfassen.

Namentlich besonders große Ladevorrichtungen können mit einem zusätzlichen, auf mindestens eines der Räder wirkenden Fahrantrieb ausgestattet sein, der zur Unterstützung der Bedienperson beim Bewegen der Ladevorrichtungen auf der (ggf. unebenen) Verkehrsfläche bzw. der Ladefläche des Transport fahrzeugs (einschließlich des Rangierens) einsetzbar ist.

Im Sinne der vorstehenden Erläuterungen der Erfindung stellt sich der bei deren Nutzung vollziehender Ablauf wie folgt dar: Frachtgut bzw. Last wird auf einem Frachtgut träger, der Teil einer anhebbaren Ladestruktur ist und über ein der Fortbewegung dienendes Fahrwerk verfügt, aufgenommen auf einer Ausgangs fläche befördert. Eine Basisstruktur wird auf der Ausgangs fläche abgesetzt, und die Ladestruktur wird - auf der Basis - struktur abgestützt - so weit angehoben, dass das Fahrwerk des Frachtgutträgers sich oberhalb des Niveaus einer gegenüber der Ausgangs fläche erhöhten Zielfläche befindet. Der Frachtgutträger wird quer zur Hubrichtung ausgefahren und dabei über die Zielfläche verfahren, und zwar ohne dass gleichzeitig die Basisstruktur bewegt wird, wobei sich der Frachtgutträger bei jenem Verfahren (ggf. nach einem Absenken) mit seinem Fahrwerk auf der Zielfläche abstützt. Die Basisstruktur wird, wenn der Frachtgutträger vollständig auf der Zielfläche aufsteht, vollständig angehoben und in Rieh-

tung auf die Frachtgutaufnahme eingefahren und über die Zielfläche verfahren. Eine Fortbewegung der Fracht bzw. Last auf der Zielfläche mittels des Fahrwerks des Frachtgutträgers kann sich anschließen, ebenso ein Lagesichern durch Abheben des Frachtgutträger- Fahrwerks von der Zielfläche unter Aufsetzen der Basisstruktur auf der Zielfläche.

Die erfindungsgemäße Ladevorrichtung kann, was allerdings für typische Anwendungen nicht erforderlich ist, mindestens eine frontseitig an dem Frachtgutträger angeordnete veränderlich positionierbare Behelfsrolle aufweisen. Diese kann notfalls im Rahmen des Übersetzens des Frachtgut trägers auf die Ladefläche des Transportfahrzeugs eingesetzt werden, beispielsweise bei instabilen Stand der Basisstruktur aufgrund eines nicht tragfähigen Untergrunds oder aber wenn die Ladevorrichtung aus irgend welchen Gründen nicht unmittelbar an das Transport fahrzeug heran gefahren werden konnte.

Aus den vorstehenden Erläuterungen ist ersichtlich, dass die Be- bzw. Entladung von Transportfahrzeugen mittels der erfindungsgemäßen Ladevorrichtung nur eine beispielhafte von vielen denkbaren Anwendungen darstellt. Einsetzbar ist die erfindungsgemäße Ladevorrichtung, die insoweit auch als kombinierte Beförder- und Hubvorrichtung bezeichnet werden könnte, auch in diversen anderen Anwendungsumgebungen, beispielsweise in der Kommissionier- und Lagertechnik.

Im Folgenden wird die vorliegende Erfindung anhand zweier in der Zeichnung veranschaulichter Ausfuhrungs - beispiele näher erläutert. Dabei zeigt

Fig. 1 in Seitenansicht eine erste Ausfuhrungs form einer erfindungsgemäßen Ladevorrichtung in einer ersten Konfiguration,

Fig. 2 in perspektivischer Ansicht die Ausführungsform nach Fig. 1 in ihrer ersten Konfiguration,

Fig. 3 in Seitenansicht die Aus führungs form nach den Fig. 1 und 2 in einer zweiten Konfiguration,

Fig. 4 in perspektivischer Ansicht die Aus führungs - form nach den Fig. 1 bis 3 in ihrer zweiten Konfiguration,

Fig. 5 in Seitenansicht die Aus führungs form nach den Fig. 1 bis 4 in einer dritten Konfiguration,

Fig. 6 in perspektivischer Ansicht die Ausführungsform nach den Fig. 1 bis 5 in ihrer dritten Konfiguration,

Fig. 7 in perspektivischer Ansicht eine zweite Ausführungsform einer erfindungsgemäßen Ladevorrichtung in einer ersten Konfiguration,

Fig. 8 die Aus führungs form nach Fig. 7 in einer zweiten Konfiguration,

Fig. 9 die Ausführungsform nach den Fig. 7 und 8 in einer dritten Konfiguration

Fig. 10 die Aus führungs form nach den Fig. 7 bis 9 in einer vierten Konfiguration und

Fig. 11 in vergrößerter Darstellung in einem Vertikalschnitt eine LadeVorrichtung mit einer über einen bevorzugten Scherenheber verfügende Hubeinrichtung.

Die in den Fig. 1 bis 6 in verschiedenen Konfigurationen (d.h. Betriebssituationen) und Ansichten gezeigte Ladevorrichtung 1 dient der Beförderung von Frachtgut F auf einer Verkehrs fläche V sowie dem Einladen des Frachtguts in ein Transport fahrzeug bzw. dem Ausladen aus diesem.

Die Ladevorrichtung umfasst drei Hauptkomponenten, nämlich eine Basisstruktur 2, eine Ladestruktur 3 und eine zwischen der Basisstruktur 2 und der Ladestruktur 3 wirkende, dem Anheben und Absenken der Ladestruktur 3 dienende Hubeinrichtung 4. Die Hubeinrichtung 4 ist dabei in dem Sinne doppelt-wirkend ausgeführt, dass sie auch geeignet ist, bei ortsfester Ladestruktur 3 die Basisstruktur 2 anzuheben.

Die Basisstruktur 2 ist als Grundrahmen 5 ausgeführt mit zwei Längsträgern 6 und zwei sich zwischen und quer zu diesen erstreckenden Querträgern 7. Beidseits stehen von den Längsträgern 6 zwei ausgesteifte Stützfüße 8 seitwärts ab. Im Sinne einer - aus Gründen der Standsicherheit ggf. zweckmäßigen - Modifikation der Basisstruktur 2 können auch ausfahrbare, ausziehbare oder ausklappbare Stützfüße mit einer im Einsatz breiteren Ausladung zum Einsatz kommen.

Die Ladestruktur 3, die eine - vorliegend eine als Ladeplattform 9 ausgeführte - Frachtgutaufnahme 10 aufweist, umfasst einen Hubrahmen 11, einen Frachtgutträger 12 mit der Ladeplattform 9 und eine Ausziehführung 13, mittels derer der Frachtgutträger 12 an dem Hubrahmen 11 ausziehbar (Pfeil A) gelagert ist. Der Hubrahmen 11 umfasst Längsträger 14 und sich zwischen und quer zu diesen erstreckende Querträger 15. An ihm greift die Hubeinrichtung 4 an. Die Ausziehrichtung A, in welcher der Frachtgutträger 12 aus seiner zu dem Hubrahmen 11 im Wesentlichen fluchtenden Stellung in eine gegenüber dem Hubrahmen 11 versetzte Stellung ausfahrbar ist, ist dabei quer zu der Hubrichtung (Pfeil B) orientiert, welche durch die Hub- und Senkbewegung der Ladestruktur 3 gegenüber der Basisstruktur 2 definiert ist. Durch Einsatz einer Zwischenschiene 16 ist die Ausziehführung 13 als Vollauszug ausgeführt, so dass der Frachtgutträger 12 in seiner ausgefahrenen Stellung vollständig gegenüber dem Hubrahmen 11 versetzt ist. Der Frachtgutträger 12 weist (nicht näher dargestellte) Halterungen auf, die zur Anbringung von Befestigungs- und/oder Sicherungsmitteln für das Frachtgut F geeignet sind. Im Sinne einer - anwendungsbezogenen - Modifikation könnte der Frachtgutträger 12, an den jeweiligen spezifischen Einsatz angepasst, im Übrigen statt einer Ladeplattform 9 beispielsweise eine Schüttgutaufnahme (wie einen Trog oder dergl.) oder eine Spezialhalterung (wie eine Kabeltrommelhalterung oder dergl.) aufweisen.

Die Hubeinrichtung 4 umfasst einen Scherenheber 17 mit zwei gekreuzten, im Kreuzungspunkt 18 gelenkig miteinander verbundenen Lenkerpaaren 19, 20. Jedes Lenkerpaar 19, 20 ist an seinem einem Ende mit dem betreffenden Bauteil über ein Festlager 21, 22 gelenkig verbunden und an seinem anderen Ende an dem anderen Bauteil längs einer Linearführung 23, 24 verschiebbar geführt. So ist das erste Lenkerpaar 19 an seinem unteren - und in Ausziehrichtung A vorderen - Ende 25 mit dem Grundrahmen 5 über ein Festlager 21 gelenkig verbunden und an seinem oberen Ende 26 an dem Hubrahmen 11 längs einer Linearführung 23 verschiebbar geführt; und das zweite Lenkerpaar 20 ist an seinem oberen Ende 27 mit dem Hubrahmen 11 über ein Festlager 22 gelenkig verbunden und an seinem unteren Ende 28 an dem Grundrahmen 5 längs einer Linearführung 24 verschiebbar geführt. Der Kreuzungspunkt 18 der beiden Lenkerpaare 19, 20 wandert demgemäß beim Anheben der Ladestruktur 3 auf einer Kreisbahn um das Festlager 21 des ersten Lenkerpaares 19 und bewegt sich dabei (auch) mit einer Bewegungskomponente in Ausziehrichtung A. Im Sinne einer - aus kinematischen Gründen ggf. zweckmäßigen - Modifikation des Scherenhebers 17 können auch (als solches bekannte) gekröpfte Lenker zum Einsatz kommen.

Vier der Fortbewegung der Ladevorrichtung 1 auf der Verkehrsfläche V - für das Befördern des Frachtguts F auf dieser - dienende Räder 29, 30 sind an dem Frachtgutträger 12 angeordnet, und zwar randseitig an diesem

unmittelbar unterhalb der Seitenränder 31. Sie bilden mit den Rahmenteilen 42 des Frachtgutträgers 12 ein Fahrwerk 43. Die - in Ausziehrichtung A - vorderen Räder 29 sind vorliegend als Bockrollen ausgeführt, die hinteren Räder 30 demgegenüber als Lenkrollen, wobei ersichtlich auch andere Ausführungen der Räder (z.B. vier Lenkrollen) möglich sind. Die Räder 29, 30 weisen (feststellbare) Bremsen auf, mittels derer sich ein unbeabsichtigtes Wegrollen des Frachtgutträgers 12 bzw. der Ladevorrichtung 1 unterbinden lässt. An der Basisstruktur 2 sind demgegenüber vorliegend keine Räder angeordnet. Die Stützfüße 8 der Basisstruktur 2 sind so dimensioniert, dass sie zwischen den hinteren Rädern 30 des Frachtgutträgers 12 hindurchpassen. Im Sinne einer Modifikation könnten die hinteren Stützfüße 8 allerdings auch nach hinten hinter die hinteren Räder 30 versetzt und in diesem Falle so dimensioniert werden, dass ihre Ausladung im Wesentlichen der Spur der Räder 29, 30 entspricht. Seitwärts über die Spurbreite der Räder 29, 30 hinaus sollte sich die Basisstruktur 2 indessen - im Interesse einer guten Handhabbarkeit der Ladevorrichtung 1 - nicht erstrecken.

Die Ladevorrichtung 1 weist mehrere Antriebe auf. So ist insbesondere die Hubeinrichtung 4 mit einer Antriebseinheit ausgerüstet. Diese umfasst zwei parallel zueinander angeordnete Hydraulikzylinder 32, die sich, gelenkig an einem der Querträger 15 des Hubrahmens 11 angelenkt, zwischen dem Hubrahmen 11 und dem im Kreuzungspunkt 18 der Lenkerpaare 19, 20 des Scherenhebers

17 angeordneten Gelenkbolzen erstrecken. Der Beaufschlagung der Hydraulikzylinder 32 dient ein - nicht dargestelltes - Hydraulikaggregat, dessen Pumpe elektrisch betrieben wird. Die elektrische Speichereinheit der Antriebseinheit ist an dem Frachtgutträger 12 angeordnet. Sie weist einen Ladeanschluss auf, der an die elektrische Anlage eines als Kraftfahrzeug ausgeführten Transportfahrzeugs anschließbar ist. Alternativ wäre, insbesondre für LadeVorrichtungen mit reduzierter Leistung, beispielsweise die rein elektrische Ausführung der Antriebseinheit der Hubeinrichtung 4 möglich.

Mittels eine weiteren Antriebs, nämlich eines zwischen dem Hubrahmen 11 und dem Frachtgutträger 12 wirkenden elektrischen Ausfahrantriebs ist der Frachtgutträger 12 in seine ausgefahrene Stellung aus- und seine zu dem Hubrahmen 11 fluchtende Stellung einfahrbar. Weiterhin ist - beispielsweise durch Arretieren der Ausziehführung 13 oder Blockieren des Ausfahrantriebs - der Frachtgutträger 12 relativ zum Hubrahmen 11 verriegelbar und die Hubeinrichtung 4 in einer teilweise angehobenen Stellung der Ladestruktur 3 sperrbar. Auf diese Weise erfolgt eine Sicherung der Ladevorrichtung 1 (und des aufgenommenen Frachtguts F) auf der Ladefläche des Transportfahrzeugs während des Transports, indem nämlich der Frachtgutträger 12 relativ zu dem Hubrahmen 11 gesperrt und die Ladestruktur 3 als ganzes so weit angehoben wird, dass die Räder 29, 30 nicht mehr auf der Ladefläche aufliegen, so dass das gesamte Gewicht von

Frachtgut F und Ladevorrichtung 1 über deren Grundrahmen 5 auf der Ladefläche abgestützt wird.

Die Bedienung bzw. Betätigung der verschiedenen Antriebe durch eine Bedienperson erfolgt bei der Ausführungsform nach den Fig. 1 bis 6 durch Bedienelemente, die in die an dem Frachtgutträger 12 angebrachten Griffe 33 integriert sind. Namentlich in dieser Hinsicht verfolgt die zweite, in den Fig. 7 bis 10 illustrierte Ausführungsform einen anderen Ansatz. Denn bei dieser ist an dem Hubrahmen 11 an dessen der Ausziehrichtung A entgegengesetztem Ende 34 eine Handhabe 35 angeordnet, welche Bedienelemente 36 für die Betätigung der verschiedenen Antriebe aufweist und die weiterhin dazu dient, die Ladevorrichtung 1 bei deren Fortbewegung auf der Verkehrsfläche bzw. der Ladefläche des Transportfahrzeuges zu dirigieren bzw. zu manövrieren.

Die Handhabe 35 weist eine leicht nach hinten geneigte, aus ihrer Verstaustellung (Fig. 7) teleskopisch in eine Betriebsstellung (Fig. 8) ausfahrbare Deichsel 37 auf. Der die Verstellung der Länge der Deichsel 37 bewirkende Längenverstellantrieb ist dabei - über die Steuerung der Ladevorrichtung 1 - in dem Sinne invers mit der Antriebseinheit der Hubeinrichtung 4 gekoppelt, dass sich beim Anheben der Ladestruktur 3 die Länge der Deichsel 37 im Wesentlichen in dem Maße verkürzt, wie die Ladestruktur 3 angehoben wird, so dass im Ergebnis die Griffe 38 der Handhabe 35 beim Heben der Ladestruktur 3 zumindest im Wesentlichen auf einer konstanten

Höhe verbleiben. Entsprechendes gilt beim Absenken der Ladestruktur 3. Über an der Handhabe 35 angeordnete Bedienelemente 36 sind bei dieser Ausführungsform im Übrigen auch die den Rädern 29, 30 zugeordneten Bremsen betätigbar.

Andere markante Abweichungen der Ausführungsform nach den Fig. 7 bis 10 von derjenigen nach den Fig. 1 bis 6 bestehen in konstruktiven Details des Scherenhebers 17 sowie der Ausziehführung 13 für den Frachtgutträger 12, wobei die Abweichungen allerdings ohne Auswirkung sind auf die grundsätzliche Funktion, so dass die vorstehenden Erläuterungen der ersten Ausführungsform im Wesentlichen auch für die zweite gelten. Anders gestaltet als bei der ersten Ausführungsform sind bei der zweiten im Übrigen auch die Räder 29, 30. Diese sind seitlich an dem Frachtgutträger 12 angeordnet, so dass sie - im Interesse einer gesteigerten Tauglichkeit für die Nutzung auf unebenen Verkehrsflächen - einen vergleichsweise großen Durchmesser aufweisen können.

Mit der Steuerung der Ladevorrichtung können im Übrigen insbesondere Lastsensoren verbunden sein, die den Rädern 29, 30 und/oder den Stützfüßen 8 der Basisstruktur 2 zugeordnet sind. Durch Überwachung der Belastungssituation an den Stützfüßen 8 und/oder den Rädern 29, 30 können Belastungszustände, die für die Standsicherheit der Ladevorrichtung 1 kritisch werden könnten, frühzeitig erkannt werden, und es kann eine (z.B. akustische)

Warnung und/oder ein automatisches Sperren eines oder mehrerer Antriebe erfolgen.

Was die in Fig. 11 veranschaulichte Ausführungsform angeht, so erklärt sich diese ohne weiteres aus den vorstehenden Erläuterungen der Fig. 1 bis 10. Hinzuweisen ist allerdings auf die gut erkennbare leichte Kröpfung der Lenker 19 und 20 des Scherenhebers 17 dergestalt, dass das im Kreuzungspunkt 18 vorgesehene Gelenk nicht exakt auf den Verbindungslinien VLi_9 und VL_2o der beiden jeweils endseitig an den Lenkern 19, 20 angeordneten Lager liegt, sondern vielmehr geringfügig gegenüber diesen Verbindungslinien nach oben versetzt. Umgekehrt ist der Anlenkungspunkt 40 der Hydraulikzylinder 32 an den Lenkern 19 geringfügig gegenüber der Verbindungslinie VL_{i9} von dessen endseitigen Lagern nach unten versetzt. Auf diese Weise ergibt sich ein Scherenheber 17, der in seiner (gezeigten) vollständig eingefahrenen Konfiguration so flach ist, dass er nicht (geringfügig nach oben zwischen die Ausziehführungen 13 ragend) nur unter der Ladestruktur 3 Platz findet, sondern auch noch eine hinreichende Bodenfreiheit 41 verbleibt, und das bei einer für das Heben schwerer Lasten hinreichend starken Dimensionierung der Lenker 19, 20 und einem auf das Heben schwerer Lasten abgestimmten Kinematik des Antriebs. Zu erkennen ist in Fig. 11 auch, dass der Hubrahmen 11 und die beiden mit diesem über die Ausziehführungen 13 verbundenen Rahmenteile 42 des Frachtgutträgers 12, wie bereits in den Figuren 1 bis 6 veranschaulicht, im Wesentlichen in der selben

Ebene liegen, wobei in der eingefahrenen Stellung des Frachtgutträgers 12 der Hubrahmen 11 zwischen den Rahmenteilen 42 des Frachtgutträgers Platz findet.

Bei beiden Ausführungsformen stellt sich der Ablauf beim Beladen eines Transportfahrzeugs mit Frachtgut F (einschließlich des Beförderns des Frachtguts zum Transportfahrzeug) typischerweise wie folgt dar:
Die Ladevorrichtung 1 wird mit abgesenkter Ladestruktur 3 und auf deren eingefahrenen Frachtgutträger 12 aufgenommenem Frachtgut F - auf den an dem Frachtgutträger 12 angeordneten Rädern 29, 30 - auf der Verkehrsfläche V zum Transportfahrzeug bewegt, wobei die Ausziehführung verriegelt und Basisstruktur 2 mittels der Hubeinrichtung 4 vollständig angehoben ist.
Die Ladevorrichtung 1 wird benachbart zum Transportfahrzeug, nahe der Zugangsöffnung zu dessen Ladefläche positioniert, und zwar mit der Ausziehrichtung A zum Transportfahrzeug weisend.
Je nach den Geländeverhältnissen können bzw. sollten in dieser Situation die Räder 29, 30 gebremst werden.
Zum Absetzen der Basisstruktur 2 auf der Verkehrsfläche und anschließendem Anheben der Ladestruktur 3 wird die Hubeinrichtung 4 betätigt, und zwar so lange, bis sich die Räder 29, 30 des Frachtgutträgers 12 geringfügig über dem Niveau der Ladefläche des Transportfahrzeugs befinden. Ggf. angezogenen Bremsen der Räder 29, 30 können wieder gelöst werden.
Nach dem Entriegeln der Ausziehführung 13 wird der Frachtgutträger 12 unter Nutzung der Ausziehführung 13

(und des ggf. vorhandenen Ausfahrantriebs) in Ausziehrichtung A verfahren und gelangt dabei zunehmend über die Ladefläche des Transportfahrzeugs.
Sobald sich die frontseitigen Räder 29 des Frachtgut - trägers 12 über der Ladefläche des Transportfahrzeugs befinden, wird die Ladestruktur 3 mittels der Hubeinrichtung 4 so weit abgesenkt, dass die frontseitigen Räder 29 des Frachtgutträgers 12 auf der Ladefläche des Transport fahrzeugs aufsetzen.
Der Frachtgutträger 12 wird - unter fortgesetzter Nutzung der Ausziehführung 13 (und ggf. des Ausfahrantriebs) - weiter in Ausziehrichtung A verfahren, wobei auch die rückwärtigen Räder 30 des Frachtgut trägers 12 auf der Ladefläche des Transport fahrzeugs aufsetzen.
Die Bremsen der Räder 29, 30 werden angezogen.
Die Hubeinrichtung 4 wird im Sinne eines Anhebens der Basisstruktur 2 betätigt.
Bei vollständig angehobener Basisstruktur 2 wird diese unter Nutzung der Ausziehführung 13 (und ggf. des Ausfahrantriebs) eingefahren, d.h. unter die Ladestruktur 3 geschoben. Anschließend wird die Ausziehführung 13 verriegelt .
Die Bremsen werden gelöst, und die Ladevorrichtung 1 kann auf der Ladefläche des Transport fahrzeugs an ihre endgültige Position rangiert werden.
Je nach den Standverhältnissen des Trägerfahrzeugs können bzw. sollten bei Erreichen der endgültigen Position die Räder 29, 30 gebremst werden.
Mittels der Hubeinrichtung 4 wird die Ladestruktur 3 geringfügig angehoben, nämlich so weit, bis die Räder

29, 30 von der Ladefläche des Transportfahrzeugs abheben. In dieser Stellung wird die Hubeinrichtung 4 gesperrt .
Je nach Bedarf kann das - auf der Ladevorrichtung 1 verbleibende - Frachtgut F mittels gesonderter Sicherungsmittel direkt am Transport fahrzeug gegen Verrutschen etc. gesichert werden.

Zum Entladen von Frachtgut aus dem Transportfahrzeug wird in umgekehrter Reihenfolge vorgegangen.

Ansprüche

1. Ladevorrichtung (1), insbesondere um Frachtgut (F) auf einer Verkehrsfläche (V) zu befördern und in ein Transportfahrzeug ein- bzw. aus diesem auszuladen, umfassend eine Basisstruktur (2), eine Ladestruktur (3) mit einer Frachtgutaufnahme (10) und eine zwischen der Basisstruktur (2) und der Ladestruktur (3) doppelt wirkende Hubeinrichtung (4), gekennzeichnet durch die folgenden Merkmale:
die Ladestruktur (3) umfasst einen Hubrahmen (11), an welchem die Hubeinrichtung (4) angreift, und einen Frachtgutträger (12), der an dem Hubrahmen (11) über eine Ausziehführung (13) mit einer quer zur Hubrichtung (B) orientierten Ausziehrichtung (A) gelagert ist und die Frachtgutaufnahme (10) aufweist;
ein der Fortbewegung der Ladevorrichtung (1) auf der Verkehrsfläche (V) dienendes Fahrwerk (43) ist Teil des Frachtgutträgers (12).

2. Ladevorrichtung nach Anspruch 1, dadurch gekennzeichnet, dass das Fahrwerk (43) Räder (29, 30), bevorzugt vier Räder (29, 30) umfasst, welche besonders bevorzugt randseitig an dem Frachtgutträger (12) angeordnet sind.

3. Ladevorrichtung nach Anspruch 2, dadurch gekennzeichnet, dass zumindest ein Teil der Räder (29, 30) lenkbar ist.

4. Ladevorrichtung nach Anspruch 2 oder Anspruch 3, dadurch gekennzeichnet, dass zumindest ein Teil der Räder (29, 30) Bremsen aufweist, welche bevorzugt fernbetätigbar sind.

5. Ladevorrichtung nach einem der Ansprüche 1 bis 4, dadurch gekennzeichnet, dass sich die Basisstruktur (2) seitwärts nicht über die Breite des Fahrwerks (43), insbesondere die Spurbreite der Räder (29, 30) hinaus erstreckt.

6. Ladevorrichtung nach Anspruch 5, dadurch gekennzeichnet, dass die Breite der Basisstruktur (2) auf deren der Ausziehrichtung (A) entgegengesetzten Seite im Wesentlichen der Breite des Fahrwerks (43), insbesondere die Spurbreite der Räder (30) entspricht.

7. LadeVorrichtung nach einem der Ansprüche 1 bis 6, dadurch gekennzeichnet, dass an der Basisstruktur (2) Stützfüße (8) angeordnet sind.

8. Ladevorrichtung nach Anspruch 7, dadurch gekennzeichnet, dass zumindest einem der Stützfüße (8) ein Lastsensor zugeordnet ist.

9. Ladevorrichtung nach Anspruch 7 oder Anspruch 8, dadurch gekennzeichnet, dass zumindest einer der Stützfüße (8) seitwärts ausfahrbar, ausziehbar oder ausklappbar ist.

10. Ladevorrichtung nach einem der Ansprüche 1 bis 9, dadurch gekennzeichnet, dass an der Basisstruktur (2) keine Räder angeordnet sind.

11. Ladevorrichtung nach einem der Ansprüche 1 bis 10, dadurch gekennzeichnet, dass ein zwischen dem Hubrahmen (11) und dem Frachtgutträger (12) wirkender Ausfahrantrieb vorgesehen ist.

12. Ladevorrichtung nach Anspruch 11, dadurch gekennzeichnet, dass auf den Ausfahrantrieb eine Steuerung einwirkt, welche die Ausfahrbewegung unter Berücksichtigung von sicherheitsrelevanten Kenngrößen steuert .

13. Ladevorrichtung nach einem der Ansprüche 1 bis 12, dadurch gekennzeichnet, dass an dem Frachtgutträger (12) , bevorzugt im Bereich frontseitiger Räder (29) , mindestens ein Sensor zur Erfassung der Position des Frachtgutträgers (12) relativ zu einer Ladefläche angeordnet ist .

14. Ladevorrichtung nach einem der Ansprüche 1 bis 13, dadurch gekennzeichnet, dass die Hubeinrichtung (4) einen Scherenheber (17) umfasst.

15. Ladevorrichtung nach Anspruch 14, dadurch gekennzeichnet, dass mindestens einer der Lenker (19, 20) des Scherenhebers gekröpft ist und/oder ein Antriebselement (32) versetzt zum Gelenkpunkt (18) an einem der Lenker (19) angreift.

16. Ladevorrichtung nach Anspruch 14 oder Anspruch 15, dadurch gekennzeichnet, dass die in Ausziehrichtung (A) gelegene Lagerung des Scherenhebers (17) an der Basisstruktur (2) als Festlager (21) ausgeführt ist.

17. Ladevorrichtung nach einem der Ansprüche 1 bis 16, dadurch gekennzeichnet, dass die Hubeinrichtung (4) eine elektrische oder eine elektro-hydraulische Antriebseinheit umfasst .

18. Ladevorrichtung nach Anspruch 17, dadurch gekennzeichnet, dass eine elektrische Speichereinheit der Antriebseinheit am Hubrahmen (11) , bevorzugt an dessen in Ausziehrichtung (A) weisender Frontseite angeordnet ist.

19. Ladevorrichtung nach Anspruch 17 oder Anspruch 18, dadurch gekennzeichnet, dass eine elektrische Speichereinheit der Antriebseinheit als Wechselakku ausgeführt ist.

20. Ladevorrichtung nach einem der Ansprüche 17 bis 19, dadurch gekennzeichnet, dass eine elektrische Speichereinheit der Antriebseinheit einen an die elektrische Anlage eines als Kraftfahrzeug ausgeführten Transportfahrzeugs anschließbaren Ladeanschluss aufweist.

21. Ladevorrichtung nach einem der Ansprüche 1 bis 20, dadurch gekennzeichnet, dass an dem Frachtgutträger (12) frontseitig mindestens eine veränderlich positionierbare Behelfsrolle angeordnet ist.

22. Ladevorrichtung nach einem der Ansprüche 1 bis 21, dadurch gekennzeichnet, dass der Frachtgutträger (12) relativ zum Hubrahmen (11) verriegelbar ist.

23. Ladevorrichtung nach einem der Ansprüche 1 bis 22, dadurch gekennzeichnet, dass die Hubeinrichtung (4) in einer teilweise angehobenen Stellung der Ladestruktur (3) sperrbar ist.

24. Ladevorrichtung nach einem der Ansprüche 1 bis 23, dadurch gekennzeichnet, dass an dem Hubrahmen (11) an dessen der Ausziehrichtung (A) entgegengesetzten Ende eine Bedienelemente aufweisende Handhabe (35) angeordnet ist.

25. Ladevorrichtung nach Anspruch 24, dadurch gekennzeichnet, dass die Handhabe (35) schwenkbar oder einschiebbar am Hubrahmen (11) oder an der Basisstruktur (2) angebracht ist.

26. LadeVorrichtung nach Anspruch 24, dadurch gekennzeichnet, dass die Handhabe (35) eine ausfahrbare Deichsel (37) aufweist, wobei die Ausfahrriehtung der Deichsel (37) bevorzugt in rückwärtiger Richtung geneigt schräg zur Hubrichtung (B) orientiert ist.

27. Ladevorrichtung nach Anspruch 26, dadurch gekennzeichnet, dass die Länge der Deichsel (37) mittels eines Längenvers tellantriebs veränderbar ist, wobei der Längenverstellantrieb bevorzugt phasenweise mit dem Hubantrieb invers koppelbar ist.

28. Ladevorrichtung nach einem der Ansprüche 1 bis 27, dadurch gekennzeichnet, dass der Frachtgutträger (12) , insbesondere als Teil eines auswechselbaren Aufsatzes, eine Ladeplattform (9) , mindestens eine Schüttgutaufnahme oder eine Spezialhalterung aufweist .

29. Ladevorrichtung nach einem der Ansprüche 1 bis 28, dadurch gekennzeichnet, dass der Frachtgutträger (12) zur Anbringung von Befestigungs- und/oder Sicherungsmitteln für das Frachtgut geeignete Halterungen aufweist.

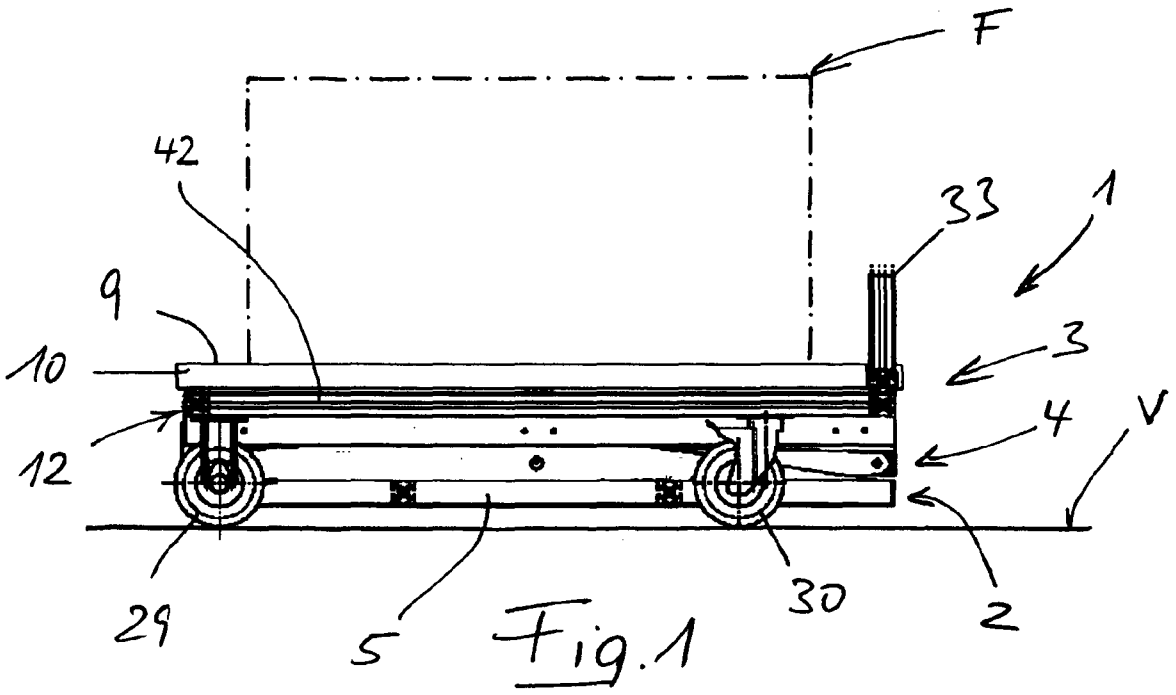


Fig.1

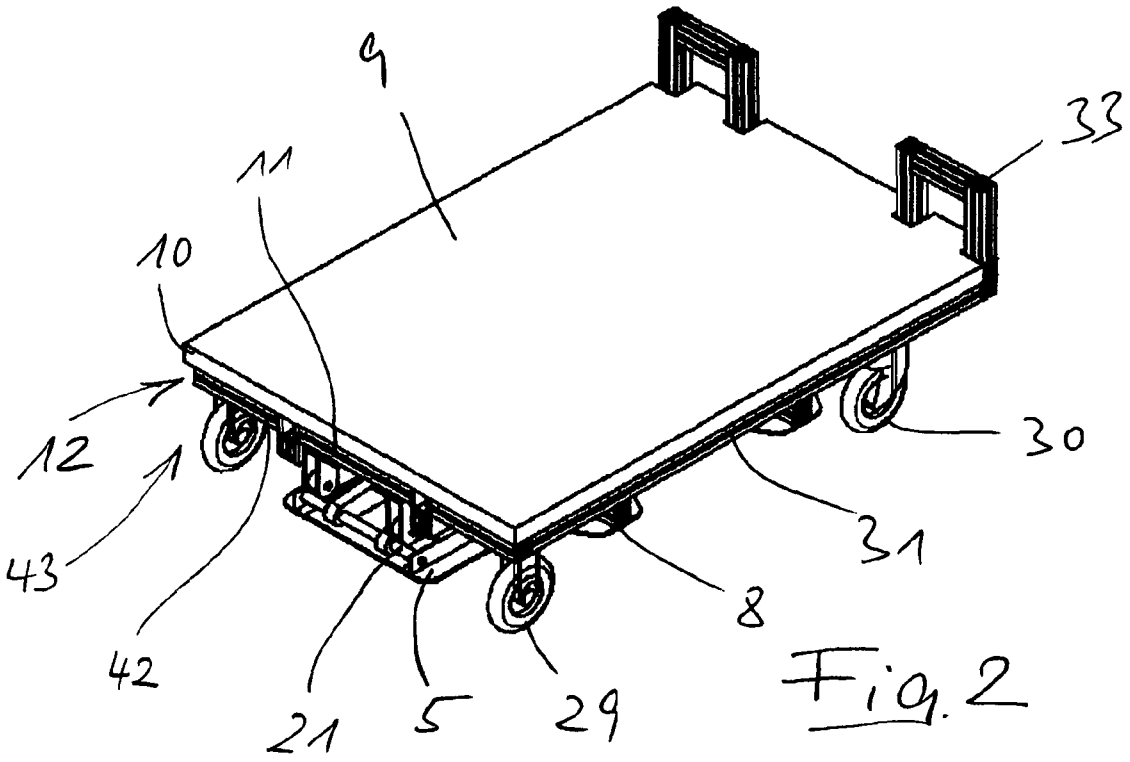


Fig.2

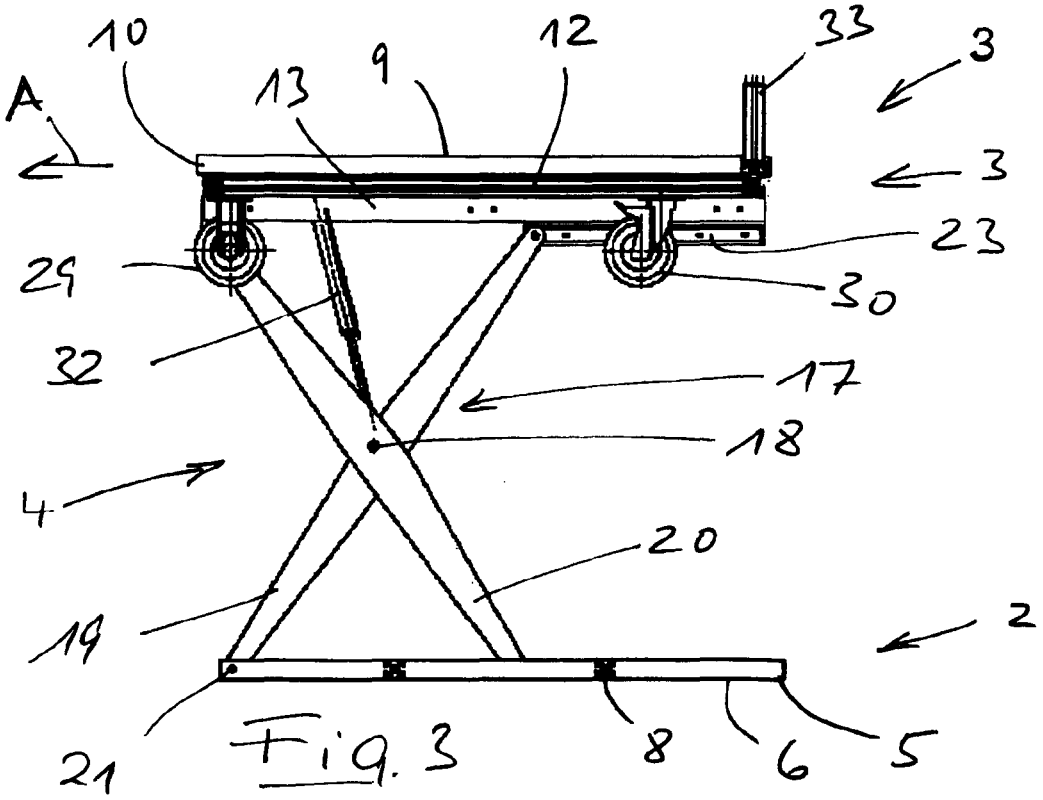

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Fig. 3

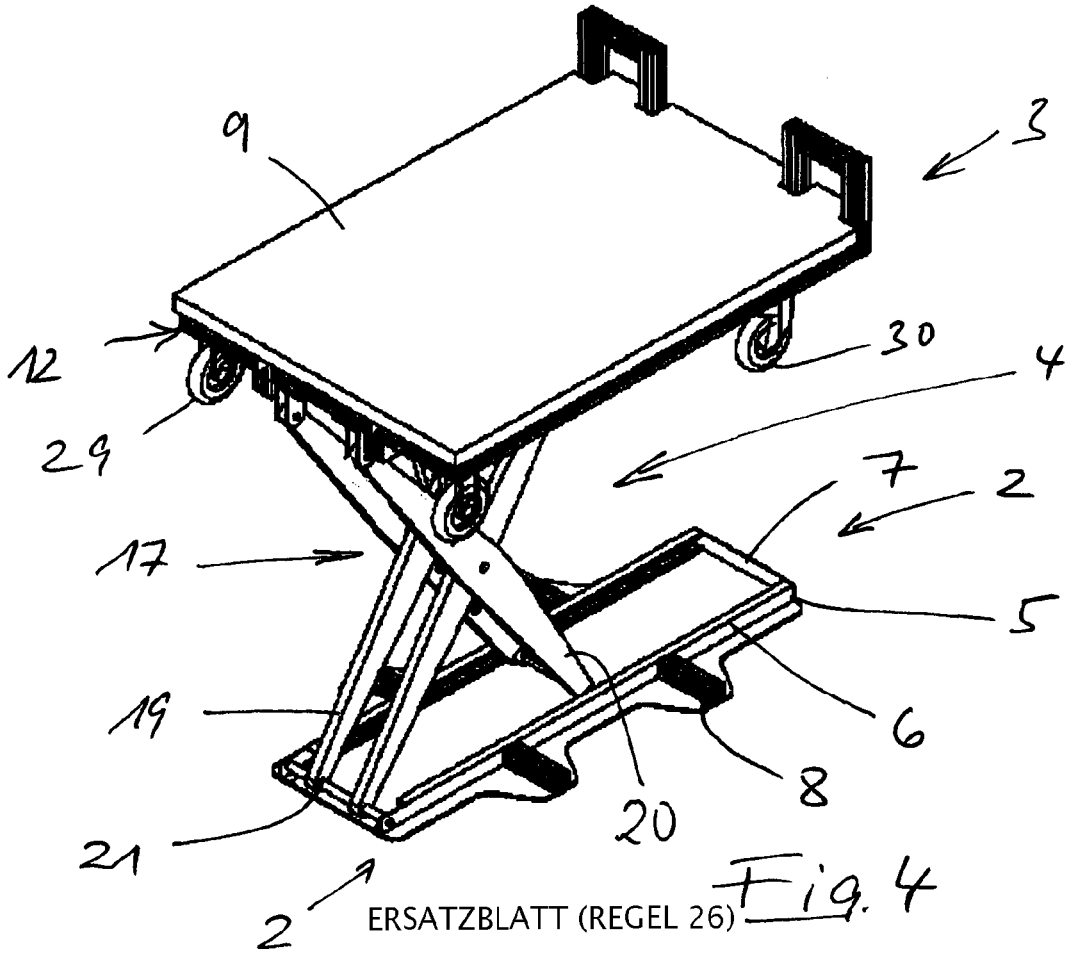

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Fig. 4

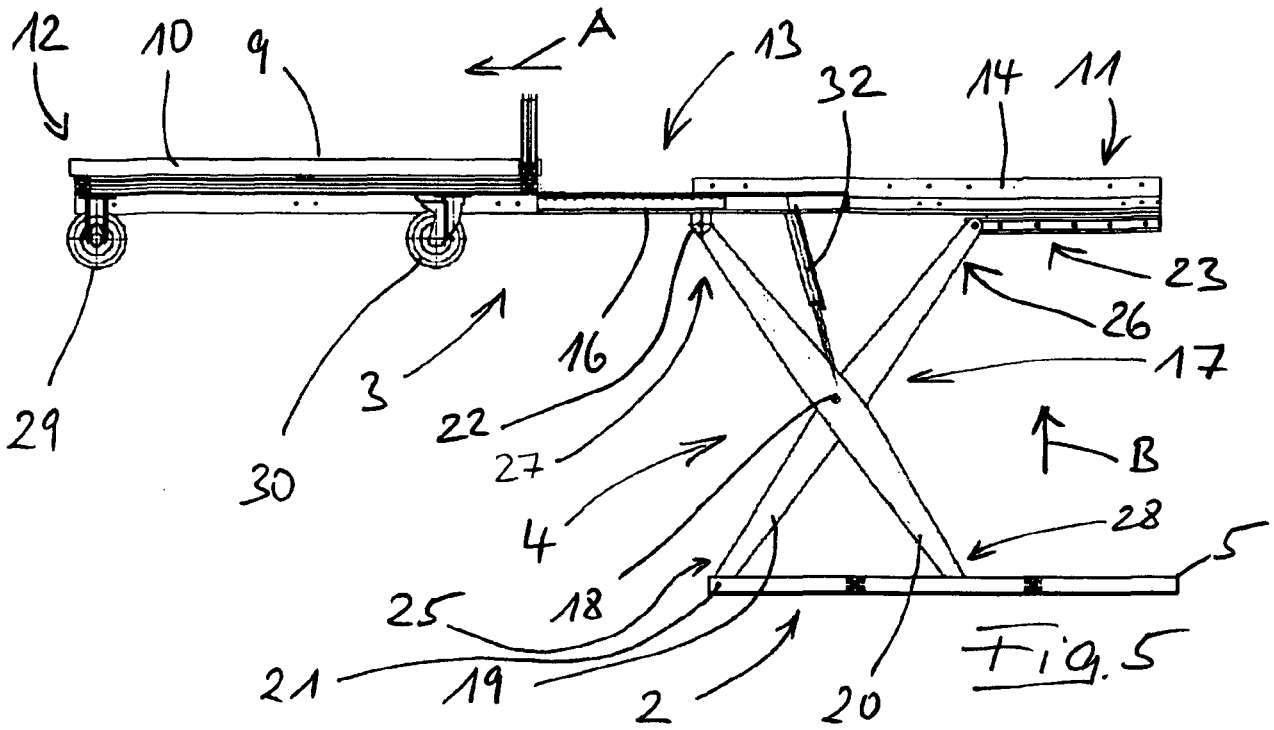

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Fig. 5

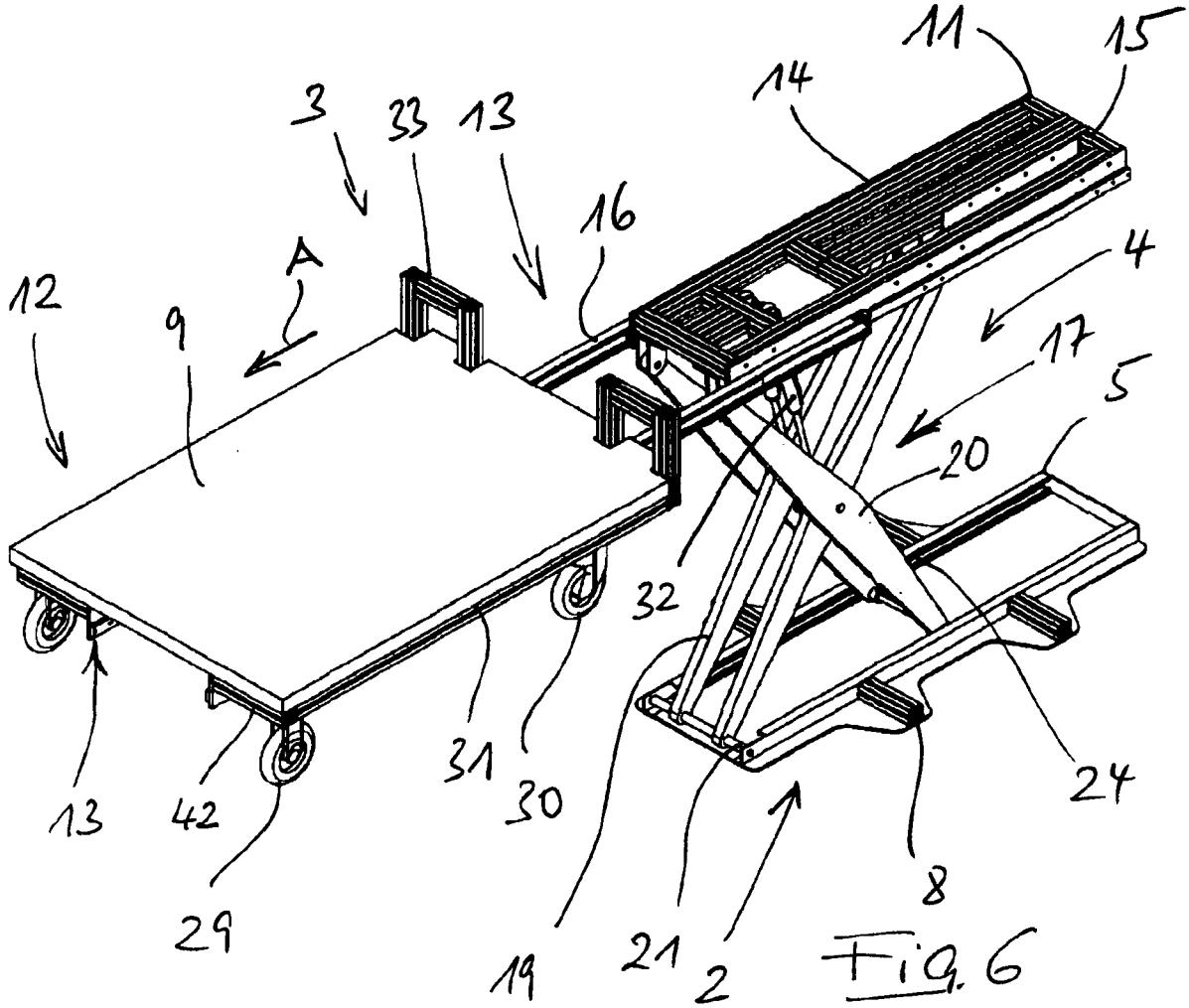

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Fig. 6

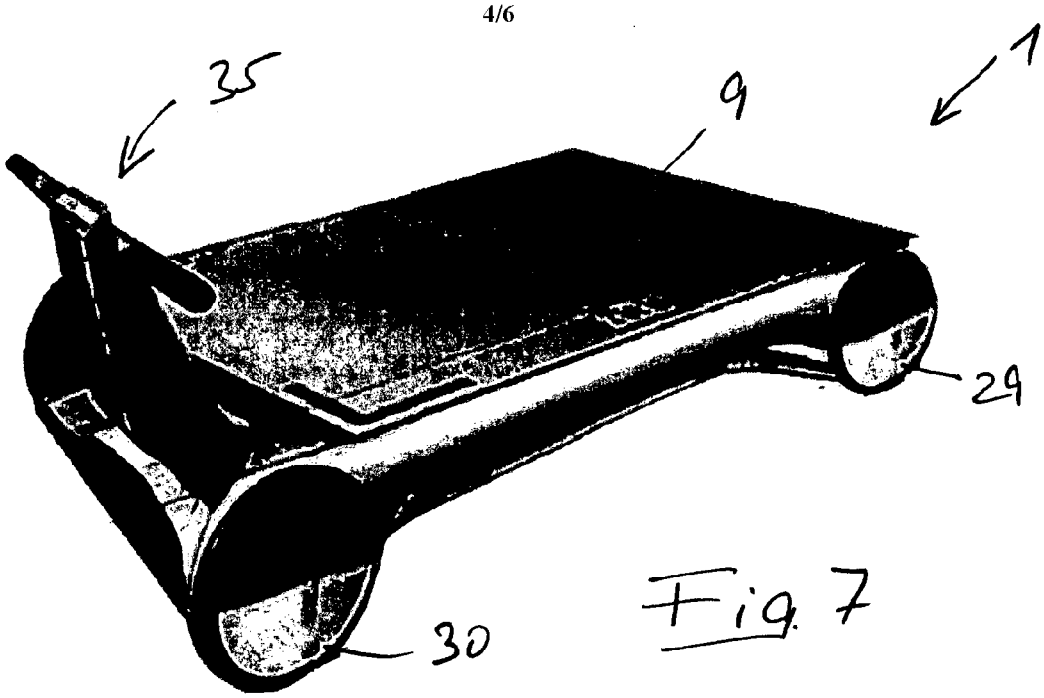


Fig. 7

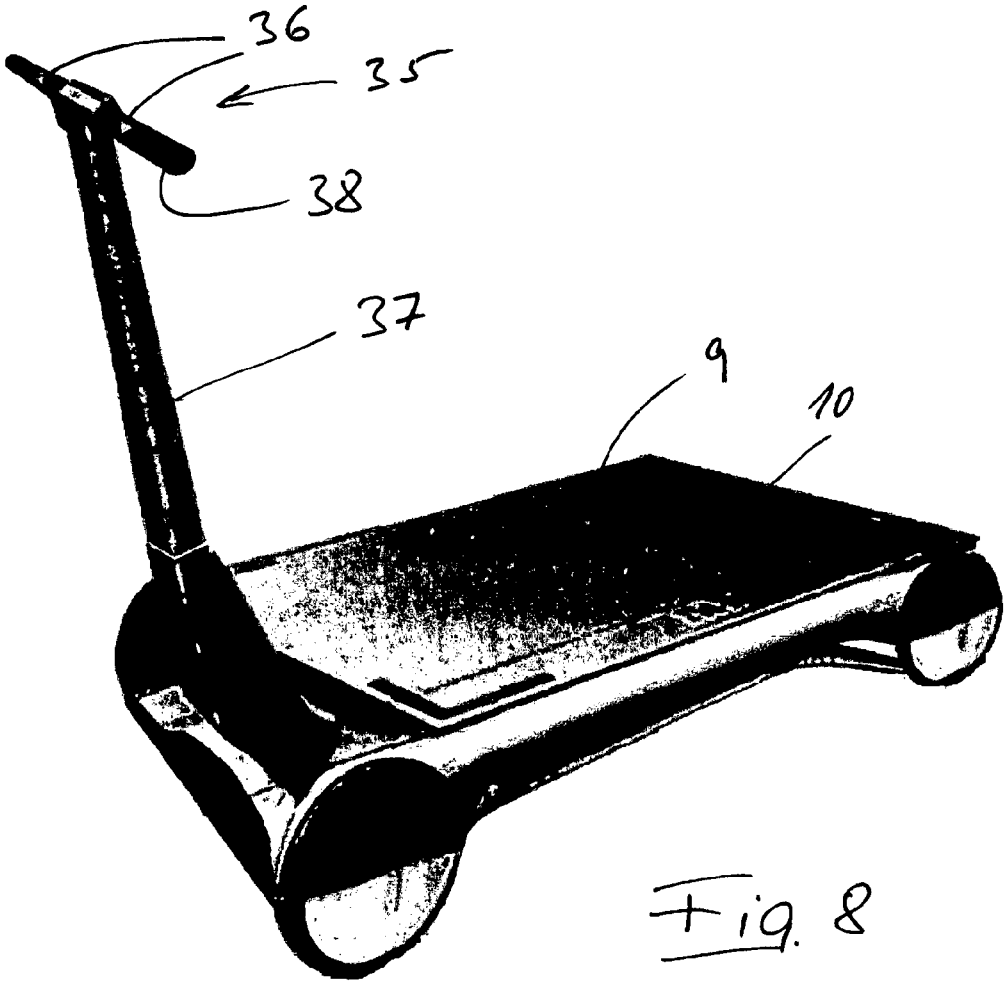


Fig. 8

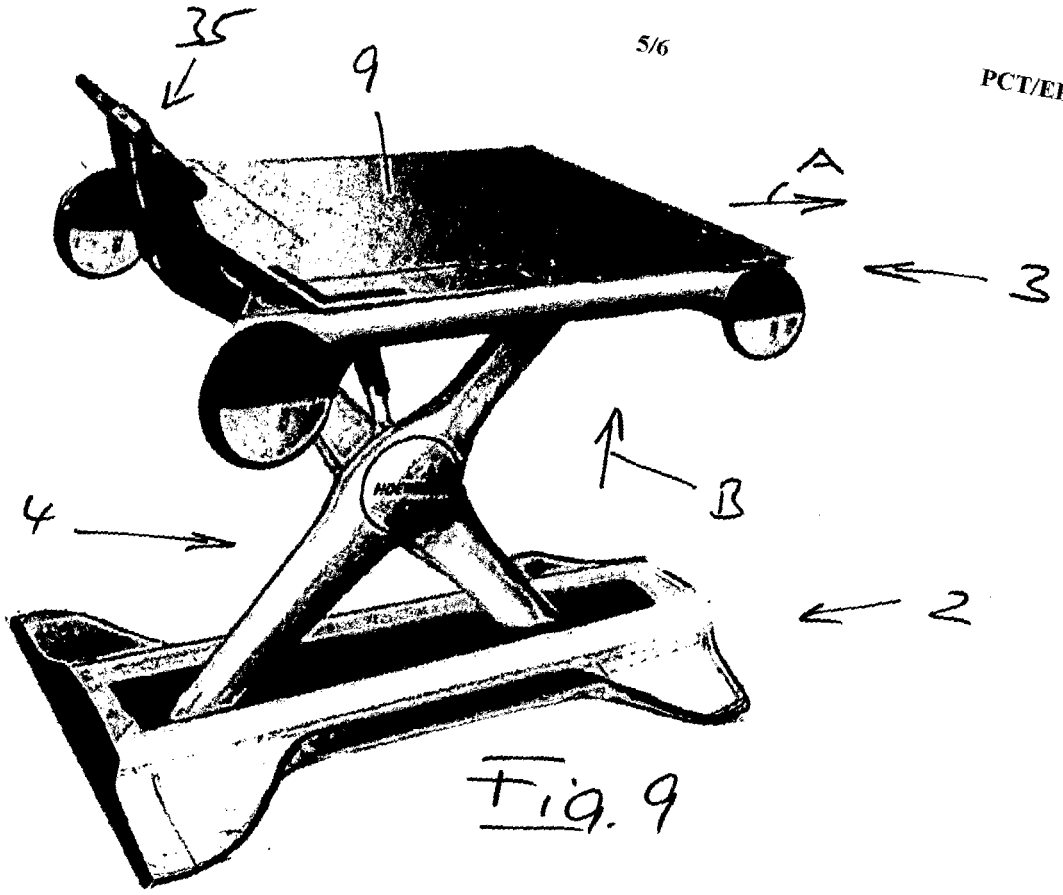


Fig. 9

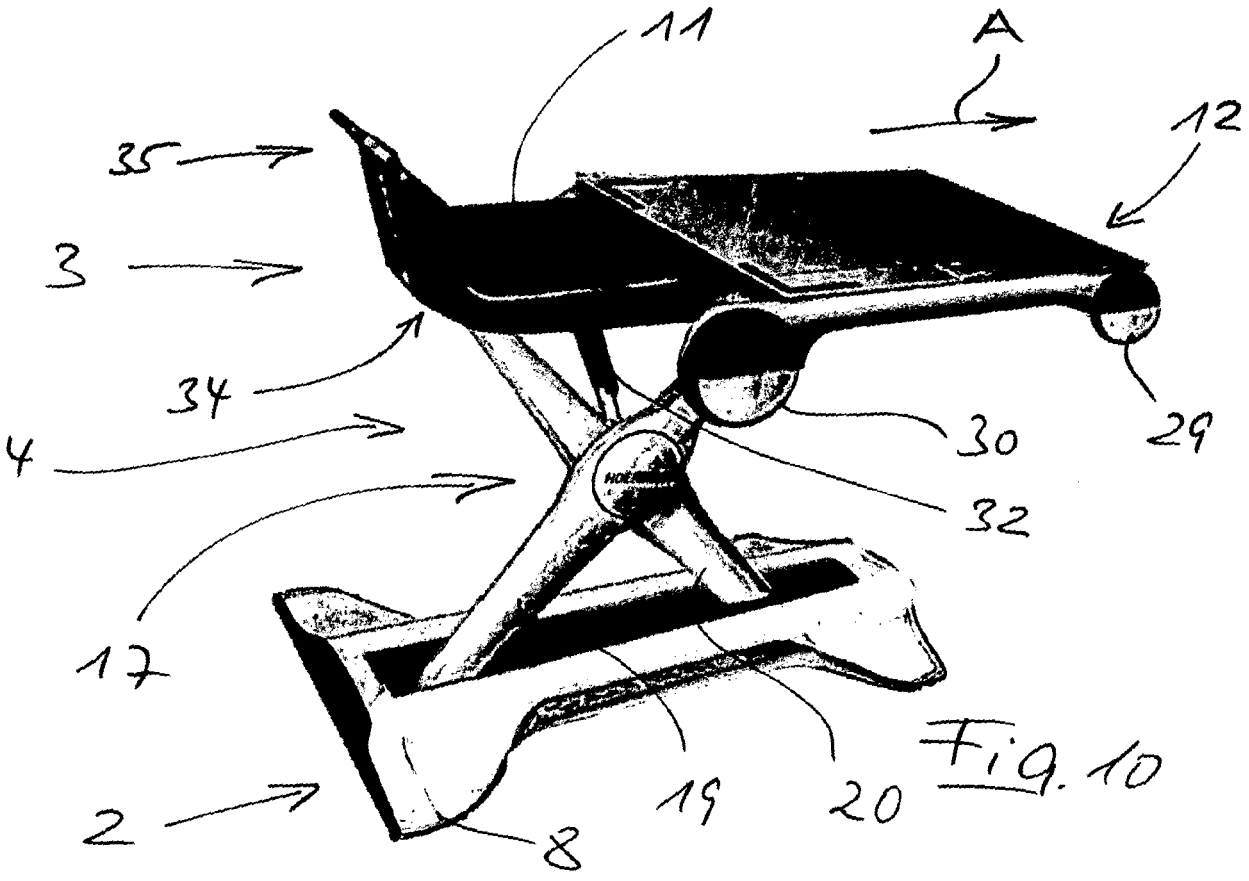


Fig. 10

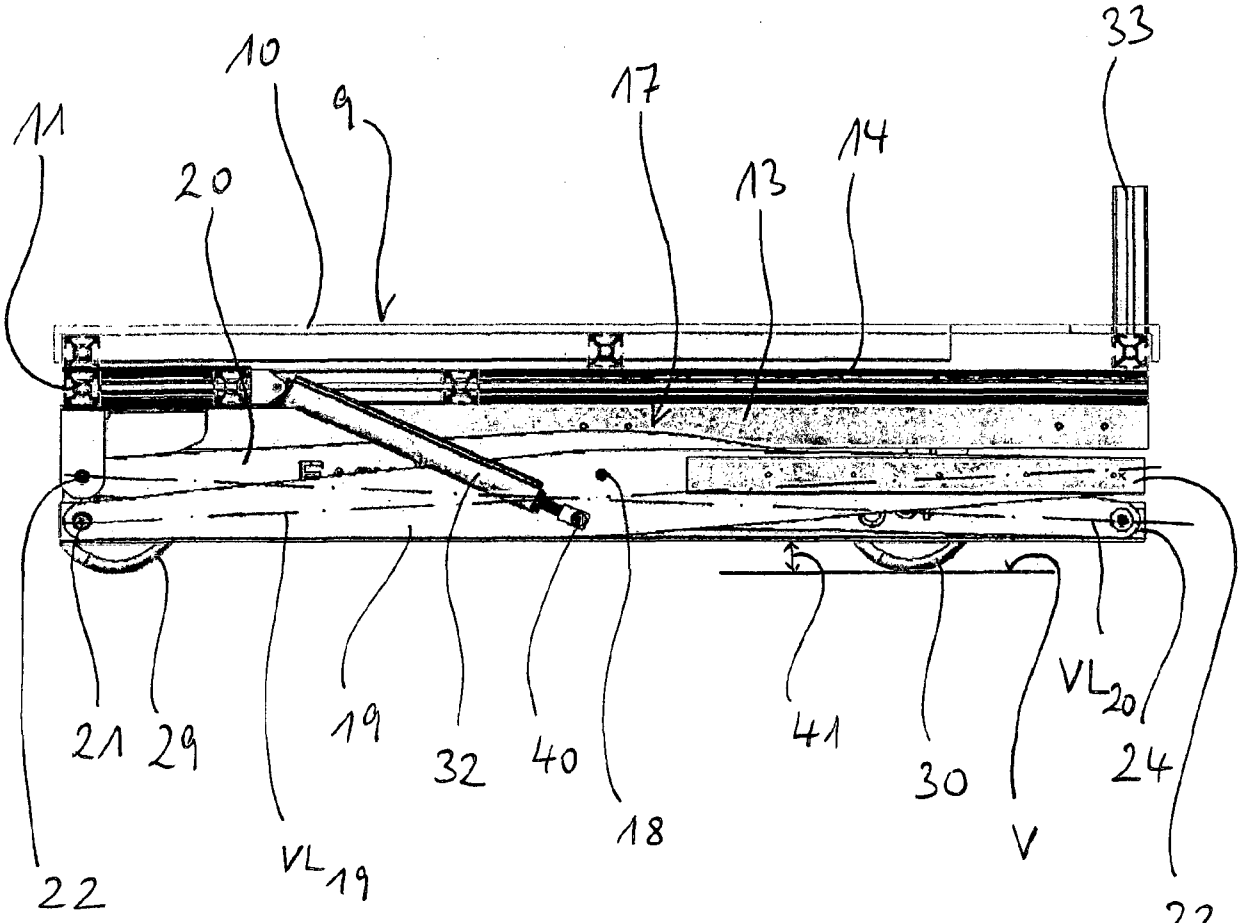


Fig. 11

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2014/0O1242

A. CLASSIFICATION OF SUBJECT MATTER
INV. B66F9/Q6 B66F9/075 B66F9/12
ADD.

According to International Patent Classification (IPC) orto both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (Classification system followed by classification symbok)
B66F

Documentation searched otherthan minimum documentation to the extent that such documents are included in thefields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal , WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	wo 20O6/006860 A2 (MOFFETT K00I B V [NL] ; VAN DALEN ROBERT [NL] ; REITSMA GERRIT [NL] ; MOL) 19 January 2006 (2006-01-19) abstract page 9, line 9 - page 11, line 21 figures 1-7	1
A	EP 1 323 664 AI (CARTON DE TOURNAI FRANCOIS XAV [BE]) 2 July 2003 (2003-07-02) abstract Paragraph [0037] Paragraph [0043] - paragraph [0044] figures 1-6	1

-/--

[X] Further documents are listed in the oontinuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

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"E" earlier application or patent but published on orafter the International filing date

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle ortheory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
22 July 2014	28/07/2014

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Cabral Matos, A

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2014/0O1242

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to Claim No.
A	FR 2 702 751 AI (BLANCHARD XAVIER [FR] BLANCHARD XAVIER) 23 September 1994 (1994-09-23) abstract page 5, line 33 - page 6, line 9 page 7, line 13 - page 9, line 8 figures -----	1
A	US 4 288 195 A (BREWER JOHN) 8 September 1981 (1981-09-08) abstract figures -----	1

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2014/001242

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EP 1323664 A1	02-07-2003	BE 1014810 A4	06-04-2004
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Form PCT/ISA/210 (patent family annex) (April 2005)

INTERNATIONALER RECHERCHENBERICHT

Internationales Aktenzeichen
PCT/EP2014/0O1242

A. KLASSIFIZIERUNG DES ANMELDUNGSGEGENSTANDES
INV. B66F9/Q6 B66F9/075 B66F9/12
ADD.

Nach der Internationalen Patentklassifikation (IPC) oder nach der nationalen Klassifikation und der IPC

B. RECHERCHIERTE GEBIETE

Recherchierter Mindestprüfstoff (Klassifikationssystem und Klassifikationssymbole)
B66F

Recherchierte, aber nicht zum Mindestprüfstoff gehörende Veröffentlichungen, soweit diese unter die recherchierten Gebiete fallen

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EPO-Internal , WPI Data

C. ALS WESENTLICH ANGESEHENE UNTERLAGEN

Kategorie*	Bezeichnung der Veröffentlichung, soweit erforderlich unter Angabe der in Betracht kommenden Teile	Betr. Anspruch Nr.
A	WO 20O6/006860 A2 (MOFFETT K00l B V [NL] ; VAN DALEN ROBERT [NL] ; REITSMA GERRIT [NL] ; MOL) 19. Januar 2006 (2006-01-19) Zusammenfassung Seite 9, Zeile 9 - Seite 11, Zeile 21 Abbildungen 1-7 -----	1
A	EP 1 323 664 Al (CARTON DE TOURNAI FRANC0IS XAV [BE]) 2. Juli 2003 (2003-07-02) Zusammenfassung Absatz [0037] Absatz [0043] - Absatz [0044] Abbildungen 1-6 -----	1
	-/--	

[X] Weitere Veröffentlichungen sind der Fortsetzung von Feld C zu entnehmen [IX] Siehe Anhang Patentfamilie

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22. Juli 2014	28/07/2014

Name und Postanschrift der Internationalen Recherchenbehörde	Bevollmächtigter Bediensteter
Europäisches Patentamt, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Cabral Matos, A

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INTERNATIONALER RECHERCHENBERICHT

Internationales Aktenzeichen
PCT/EP2014/0O1242

C. (Fortsetzung) ALS WESENTLICH ANGESEHENE UNTERLAGEN

Kategorie *	Bezeichnung der Veröffentlichung, soweit erforderlich unter Angabe der in Betracht kommenden Teile	Betr. Anspruch Nr.
A	FR 2 702 751 AI (BLANCHARD XAVIER [FR] BLANCHARD XAVIER) 23. September 1994 (1994-09-23) Zusammenfassung Seite 5, Zeile 33 - Seite 6, Zeile 9 Seite 7, Zeile 13 - Seite 9, Zeile 8 Abbi 1düngen -----	1
A	US 4 288 195 A (BREWER JOHN) 8. September 1981 (1981-09-08) Zusammenfassung Abbi 1düngen -----	1

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Angaben zu Veröffentlichungen, die zur selben Patentfamilie gehören

Internationales Aktenzeichen
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Im Recherchenbericht angeführtes Patentdokument	Datum der Veröffentlichung	Mitglied(er) der Patentfamilie	Datum der Veröffentlichung
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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/493,830	Poniatowski, Nathan Mark
	Examiner	Art Unit
	JANET M WILKENS	3637

CPC - Searched*		
Symbol	Date	Examiner
A47B1/03; 21/0314,00,02,03,04	09/26/2022	JMW
A47B9/16; 2021/0321,0364,0335	09/26/2022	JMW
A47B3/00; 61/00	09/26/2022	JMW
A47B3/02,0809,0815; 2003/025	09/26/2022	JMW

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner
312	208.1,223.3	09/26/2022	JMW
248	421,562,588, 585,431 ,432,439	09/26/2022	JMW
108	147,144.11,145,93, 96,116-118,120.43, 138,50.01,50.02,28	09/26/2022	JMW

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
updated search from parent cases	09/26/2022	JMW

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/493,830	Poniatowski, Nathan Mark
	Examiner	Art Unit
	JANET M WILKENS	3637

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/493,830	Poniatowski, Nathan Mark
	Examiner	**Art Unit**
	JANET M WILKENS	3637

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS										
☐ Claims renumbered in the same order as presented by applicant			☐ CPA		☐ T.D.		☐ R.1.47			
CLAIM		**DATE**								
Final	Original	09/26/2022								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
	6	✓								
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	30	✓								

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	17493830
Filing Date	2021-10-04
First Named Inventor	Nathan Mark Poniatowski
Art Unit	3637
Examiner Name	
Attorney Docket Number	1001-001US13

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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	13	20140144352	A1	2014-05-29	Roberts	

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.M.W/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17493830
	Filing Date	2021-10-04
	First Named Inventor	Nathan Mark Poniatowski
	Art Unit	3637
	Examiner Name	
	Attorney Docket Number	1001-001US13

	14	20150028787	A1	2015-01-29	Sekine et al.	
	15	20150216296	A1	2015-08-06	Mitchell	
	16	20150289641	A1	2015-10-15	Ergun et al.	
	17	20160249737	A1	2016-09-01	Han	
	18	20160338486	A1	2016-11-24	Martin	
	19	20160353880	A1	2016-12-08	Sigal et al.	
	20	20170071332	A1	2017-03-16	Herring et al.	
	21	20170196351	A1	2017-07-13	Failing	
	22	20170354245	A1	2017-12-14	Martin et al.	
	23	20180177289	A1	2018-06-28	Chen	
	24	20180213929	A1	2018-08-02	Ergun et al.	

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.M.W/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Art Unit	3637
	Examiner Name	
	Attorney Docket Number	1001-001US13

	25	20180279770	A1	2018-10-04	Crowe et al.	
	26	20190110588	A1	2019-04-18	WONG	
	27	20190183239	A1	2019-06-20	SEMMELRATH et al.	
	28	20190269237	A1	2019-09-05	ZHU	
	29	20200029685	A1	2020-01-30	DU et al.	
	30	20200107633	A1	2020-04-09	Kang	

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	102599728	CN	A	2012-07-25	Xu		
	2	107048694	CN	A	2017-08-18	Dai et al.		
	3	107048695	CN	A	2017-08-18	Tang		

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Application Number	17493830
Filing Date	2021-10-04
First Named Inventor	Nathan Mark Poniatowski
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Examiner Name	
Attorney Docket Number	1001-001US13

	4	107212587	CN	A	2017-09-29	Wang		
	5	107744256	CN	A	2018-03-02	Han et al.		
	6	107756350	CN	A	2018-03-06	Zhao et al.		
	7	107912868	CN	A	2018-04-17	Cui		
	8	109008216	CN	A	2018-12-18	Kang		
	9	110840072	CN	A	2020-02-28	JIAXING BAOGONG INTELLIGENT TECH CO LTD		
	10	202681005	CN	U	2013-01-23	钟兴华		☒
	11	202681013	CN	U	2013-01-23	Xinghua		☐
	12	202874336	CN	U	2013-04-17	Xinghua		☐
	13	203333240	CN	U	2013-12-11	魏录顺		☒
	14	203934825	CN	U	2014-11-12	张俏卿		☒

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Application Number	17493830
Filing Date	2021-10-04
First Named Inventor	Nathan Mark Poniatowski
Art Unit	3637
Examiner Name	
Attorney Docket Number	1001-001US13

	15	208403596	CN	U	2019-01-22	丘国兴		☐
	16	102013008020	DE	A1	2014-11-13	Baudermann		☐
	17	19526596	DE		2004-12-16	Clamor et al.		☐
	18	202016101126	DE	U1	2016-06-21	Wu		☐
	19	2851555	DE	A1	1980-06-04	Adler et al.		☐
	20	29515642	DE	U1	1996-01-18	OTM MOEBELWERKE HELMUT SEIDEL		☐
	21	4424564	DE	A1	1996-01-18	Kluegl et al.		☐
	22	8606822	DE	U1	1991-08-14	PRINZESS-MOEBEL GUSTAV WERITZ		☐
	23	0613852	EP	B1	1997-11-05	Janzen		☐
	24	2745733	EP	A1	2014-06-25	Barea		☐
	25	3092918	EP	A1	2016-11-16	Campo		☐

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Filing Date	2021-10-04
First Named Inventor	Nathan Mark Poniatowski
Art Unit	3637
Examiner Name	
Attorney Docket Number	1001-001US13

	26	2637165	FR	A1	1990-04-06	Thoreau		☐
	27	2894794	FR	A1	2007-06-22	Hoh		☐
	28	3028735	FR	B1	2018-02-16	Kalogeropoulos et al.		☐
	29	2017045506	JP	A	2017-03-02	IGARASHI et al.		☐
	30	6861051	JP	B2	2018-02-16	牛尾　将徳 et al.		☐
	31	101635611	KR	B1	2016-07-11	Tae		☐
	32	101969133	KR	B1	2019-08-13	김진태 et al.		☒
	33	20140004886	KR	U	2014-09-03	Song		☐
	34	20160074221	KR	A	2016-06-28	Jung		☐
	35	1011051	NL	C2	2000-07-19	Klaveren		☐
	36	1991017906	WO	A1	1991-11-28	Lindahl		☐

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	First Named Inventor	Nathan Mark Poniatowski
	Art Unit	3637
	Examiner Name	
	Attorney Docket Number	1001-001US13

	37	2017045506	WO	A1	2017-03-23	Xiang et al.		☐
	38	2018093007	WO	A1	2018-05-24	Bae et al.		☐
	39	2019001506	WO	A1	2019-01-03	Chen		☐
	40	2019001507	WO	A1	2019-01-03	Chen		☐

If you wish to add additional Foreign Patent Document citation information please click the Add button [Add]

NON-PATENT LITERATURE DOCUMENTS [Remove]

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T5
	1	Adjustable Desk: VARIDESK, http://www.varidesk.com, United States of America, 03/30/2013	
	2	ERGOTRON, http://www.ergotron.com, United States of America, 09/29/2014	
	3	Levine, James A. "Sitting down is KILLING you! Heart disease, obesity, depression and crumbling bones - a terrifying new book by a top doctor reveals they are all linked to the hours we spend in chairs" Daily Mail Online, July 26, 2014, 9 pages [online], [retrieved on 06-30-2017]. Retrieved from the Internet at: http://www.dailymail.co.uk/news/article-2706317	

If you wish to add additional non-patent literature document citation information please click the Add button [Add]

EXAMINER SIGNATURE

Examiner Signature	/JANET M WILKENS/	Date Considered	09/23/2022

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.M.W/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17493830
	Filing Date	2021-10-04
	First Named Inventor	Nathan Mark Poniatowski
	Art Unit	3637
	Examiner Name	
	Attorney Docket Number	1001-001US13

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /J.M.W/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	17493830
Filing Date	2021-10-04
First Named Inventor	Nathan Mark Poniatowski
Art Unit	3637
Examiner Name	
Attorney Docket Number	1001-001US13

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Daniel T. Lund/	Date (YYYY-MM-DD)	2022-04-26
Name/Print	Daniel T. Lund	Registration Number	58614

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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United States Patent and Trademark Office
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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/493,830	10/04/2021	Nathan Mark Poniatowski	1001-001US13	4682

155431 7590 10/05/2022

Lund IP
1125 2nd Ave
Newport, MN 55055

EXAMINER	
WILKENS, JANET MARIE	
ART UNIT	**PAPER NUMBER**
3637	
NOTIFICATION DATE	**DELIVERY MODE**
10/05/2022	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

eofficeaction@appcoll.com
info@lundip.com

PTOL-90A (Rev. 04/07)

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR/ PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
17/493,830	10/04/2021	Poniatowski, Nathan Mark	1001-001US13

	EXAMINER	
Lund IP 1125 2nd Ave Newport, MN 55055	JANET M WILKENS	
	ART UNIT	PAPER
	3637	20220927

DATE MAILED: _____

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Commissioner for Patents

The following paragraph with inadvertently omitted from the Office action of September 26, 2022.

Information Disclosure Statement
The information disclosure statement filed April 26, 2022 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because there is no English translation/abstract for reference CN107048694. Also references DE2851555 and JP5861051 have been crossed out because they are repeats (considered in other IDSs). It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609.05(a).

/JANET M WILKENS/
Primary Examiner, Art Unit 3637

PTO-90C (Rev.04-03)

Electronic Acknowledgement Receipt

EFS ID:	47293285
Application Number:	17493830
International Application Number:	
Confirmation Number:	4682
Title of Invention:	DESKTOP WORKSPACE THAT ADJUSTS VERTICALLY
First Named Inventor/Applicant Name:	Nathan Mark Poniatowski
Customer Number:	155431
Filer:	Daniel Thomas Lund
Filer Authorized By:	
Attorney Docket Number:	1001-001US13
Receipt Date:	29-DEC-2022
Filing Date:	04-OCT-2021
Time Stamp:	14:48:04
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$370
RAM confirmation Number	E2022BSE48331188
Deposit Account	602335
Authorized User	Daniel Lund

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		Amendment.pdf	185645 12ea4157bdbe90f8f83e906e7e83be1580a65389	yes	11
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Amendment/Request for Reconsideration-After Non-Final Rejection		1	1	
	Claims		2	9	
	Applicant Arguments/Remarks Made in an Amendment		10	11	
Warnings:					
Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	IDS.pdf	1287632 8ef62cb97e266ef67cd8fd8f2eb254c008beaac1	no	7
Warnings:					
Information:					
3	Foreign Reference	CN107048694A.pdf	1074851 11e2df9b00c82b3ff8543733426a7d5bd3c579e7	no	17
Warnings:					
Information:					
4	Non Patent Literature	CN107048694A_translation.pdf	344908 268ccfc6a0ef4b93fc58b665eacd8e9fa4310acd	no	6
Warnings:					
Information:					
5	Foreign Reference	CN207186305U.pdf	310490 d58e2ca6e06c61e0ced6e38afd3ee816b9bbdeee	no	8

Warnings:					
Information:					
6	Non Patent Literature	CN207186305U_translation.pdf	620722 b503a59c04927460fde4e1cfc57667759d48614c	no	5
Warnings:					
Information:					
7	Foreign Reference	DE9302967U1.pdf	1136218 1d9ba3b8e44f888490b9847b8462c06dd102e7d8	no	17
Warnings:					
Information:					
8	Non Patent Literature	DE9302967U1_translation.pdf	300240 7d8980e06c0771ca8c9de00aa3d4f8141f128062	no	12
Warnings:					
Information:					
9	Foreign Reference	KR200479292Y1.pdf	1727966 6b3d6e261c242c9e510d72f725da3ebdf12764ad	no	16
Warnings:					
Information:					
10	Non Patent Literature	KR200479292_translation.pdf	1112664 dd9c09ee02eb3ebcbd3b05db901dc0a452395057	no	10
Warnings:					
Information:					
11	Foreign Reference	WO8304168A1.pdf	511380 10e58c69339a57921943bf1cd659354cf700b1cd	no	12
Warnings:					
Information:					
12	Fee Worksheet (SB06)	fee-info.pdf	40321 bea56247b0ef1790e806d6682a23ddc0e2e9186b	no	2
Warnings:					
Information:					

Total Files Size (in bytes):	8653037

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 17/493,830	Filing Date 10/04/2021	☐ To be Mailed

ENTITY: ☐ LARGE ☑ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $50 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $240 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	12/29/2022	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 30	Minus	** 30	= 0		x $40 =	0
	Independent (37 CFR 1.16(h))	* 4	Minus	*** 3	= 1		x $192 =	192
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	192

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	SLIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/TONGELINA C TUBBS/
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Scherenhubtisch

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Scherenhubtisch

Die Erfindung betrifft einen Scherenhubtisch nach dem Oberbegriff des Anspruchs 1.

Bei einem Scherenhubtisch der vorstehend genannten, aus der DE 39 30 529 A1 bekannten Art ist zumindest einer der als ein Paar zusammenwirkenden und im Bereich eines Kreuzungsgelenks verbundenen Scherenarme mit einem eine erste Kolben/Zylinder-Einheit aufweisenden Spreizhebel versehen, mit dem die in einer Ausgangsstellung nahe einem Unterrahmen befindlichen Scherenarme aus einer Absenkstellung herausgespreizt, bei Erreichen einer Anfangshublage über eine zweite Kolben/Zylinder-Einheit weiter gespreizt und so eine Tischplattform bis in eine Hubendstellung verbracht werden kann. Mit einer derartigen Anordnung von zwei über eine gemeinsame Steuereinheit parallel geschalteten Kolben/Zylinder-Einheiten sind sowohl der technische Aufwand als auch die Gestehungs- und Betriebskosten nachteilig erhöht.

Der Erfindung liegt die Aufgabe zugrunde, einen Scherenhubtisch der eingangs genannten Art unter

Verringerung des technischen Aufwands so weiterzubilden, daß dieser bei in Absenkstellung befindlichen Scherenarmen eine flache und raumsparende Bauform ermöglicht und über eine gleichmäßige Hubbewegung ein großer Hubweg der Tischplattform erreichbar ist.

Die Erfindung löst diese Aufgabe durch einen Scherenhubtisch mit den Merkmalen des Anspruchs 1. Hinsichtlich weiterer Ausgestaltungen wird auf die Ansprüche 2 bis 12 verwiesen.

Der erfindungsgemäße Scherenhubtisch weist mit der Hubschwinge ein mit der Kolben/Zylinder-Einheit verbundenes Hubeinleitungsglied auf, das mit einer einerseits unmittelbar im Kreuzungsgelenk vorgesehenen koaxialen Verbindung zu den jeweiligen Scherenarmen, der dazu achsparallel angeordneten Anlenkung des Kolbenstangenendes und der andererseits abgestützten Druckrolle eine Wirkverbindung bildet, die eine vorteilhafte Flachbauweise des Scherenhubtisches ermöglicht, dessen Tischplattform ohne zusätzliche Einzelteile aus der bodennahen Absenkstellung bis in die Hubendstellung durch eine kontinuierliche Ausnutzung des Kolbenhubes nur einer Kolben/Zylinder-Einheit verbringbar ist.

Über die Tischplattform als unmittelbarer Teil des Kraftflusses im Scherenhubtisch wird dabei ausgehend von einer parallelen Ausgangsstellung der Scherenarme eine in einer ersten Hubphase wirksame Zugbewegung auf die zu spreizenden Scherenarme über die Druckrolle eingeleitet und dabei ab einem bestimmten Hubwinkel die Hubschwinge gegen weiteres Schwenken so arretiert, daß über die fortgesetzte Hubbewegung der Kolben/Zylinder-Einheit den Scherenarmen über die Hubschwinge ein Drehmoment vermittelt und unter

Spreizung der Scherenarme die Tischplattform bis in die Hubendstellung angehoben wird.

Mit der Kolbenstangenanlenkung in einem, im wesentlichen von der Bauteilhöhe der in Absenkstellung befindlichen Scherenarme bestimmten Abstand zur Mittellängsebene der Kolben/Zylinder-Einheit ist mit geringem Aufwand eine asymmetrische Anlenkung gebildet, die mit wenigen Gelenkpunkten in der ersten Hubphase eine Druckhebung der Tischplattform ermöglicht. Über eine entsprechende Verbindung der Tischplattform mit den Scherenarmenden wird deren gegenseitige Spreizung bewirkt, wobei daß nach einem bestimmten Hubweg ein gleichzeitig in einen Verbindungseingriff an der Hubschwinge einlaufender Anlageteil an zumindest einem Scherenarm einen kontinuierlichen Druckeintrag aus der Kolben/Zylinder-Einheit ermöglicht, deren weitere Kolbenausschiebung über einen an der Hubschwinge gebildeten, konstanten Hebelarm umgelenkt und so die Tischplattform mit weitgehend konstantem Zylinderinnendruck bis in die Hubendstellung bewegt werden kann.

Hinsichtlich wesentlicher weiterer Vorteile und Einzelteile der Erfindung wird auf die nachfolgende Beschreibung und die Zeichnung verwiesen, in der ein Ausführungsbeispiel des Gegenstands der Erfindung schematisch näher veranschaulicht ist. In der Zeichnung zeigen:

Fig. 1 eine Perspektivdarstellung eines erfindungsgemäßen Scherenhubtisches,

Fig. 2 eine Seitenansicht des Scherenhubtisches ähnlich Fig. 1 mit einer Tischplattform in einer bodennahen Ausgangsstellung,

Fig. 3 eine Seitenansicht des Scherenhubtisches gemäß Fig. 2 mit der Tischplattform am Ende einer ersten Hubphase,

Fig. 4 eine Seitenansicht des Scherenhubtisches gemäß Fig. 2 oder 3 mit der Tischplattform in einer oberen Endstellung,

Fig. 5 eine Ausschnittsvergrößerung im Bereich eines Kreuzungsgelenks der Scherenarme des Scherenhubtisches gemäß Fig. 4,

Fig. 6 eine vergrößerte Ausschnittsdarstellung ähnlich Fig. 5 mit den Scherenarmen in einer Hubphase gemäß Fig. 3,

Fig. 7 und 8 jeweils eine Einzeldarstellung einer Hubschwinge gemäß der Erfindung in verschiedenen Ansichten, und

Fig. 9 eine Seitenansicht im Bereich des Kreuzungsgelenks gemäß Fig. 5.

In Fig. 1 ist ein insgesamt mit 1 bezeichneter, als Flachhubtisch ausgebildeter Scherenhubtisch in einer Perspektivdarstellung veranschaulicht, der zwischen einem bodenseitigen Unterrahmen 2 und einer oberen Tischplattform 3 jeweils längsrandseitig angeordnete, in einem Kreuzungsgelenk 4,4' jeweils paarweise miteinander verbundene Scherenarme 5,6 bzw. 7,8 aufweist.

Die Tischplattform 3 ist dabei mit einer E-förmigen, jeweilige äußere Plattenbereiche 9,10 und einen Mittelbereich 11 aufweisenden Plattenkontur versehen, mit der über jeweilige Formaussparungen 12,13 bei-

spielsweise ein Hubwerkzeug (nicht dargestellt) die auf der Tischplattform 3 befindlichen Gegenstände untergreifen kann. Ebenso ist denkbar, die Tischplattform 3 für andere, insbesondere eine Flachbauweise erfordernde Anwendungsfälle als durchgehende Platte bzw. mit einer U-förmigen Plattenkontur auszubilden.

In Fig. 4 veranschaulicht eine Seitenansicht des Scherenhubtisches 1 eine in jeweils gegenüberliegenden Endbereichen 14,15 bzw. 16,17 der Scherenarme 5,6 vorgesehene Verbindung, wobei diese einenends ortsfest über jeweils ein Schwenklager 18,19 und anderenends über ein Loslager 20,21 an der Unterseite der Tischplattform 3 bzw. der Oberseite des Unterrahmens 2 so ausgebildet ist, daß die Tischplattform 3 in unterschiedliche Hubhöhen H (Fig. 2), H' (Fig. 3) und H'' (Fig. 4) verbringbar ist.

Die Scherenarmpaare 5,6 bzw. 7,8 sind dabei jeweils im Bereich des über das ortsfeste Schwenklager 19,19' abgestützten Scherenarmes 6 bzw. 8 mit einer als Hydraulikzylinder ausgebildeten Kolben/Zylinder-Einheit 23,24 versehen, die sich zwischen jeweiligen Schenkeln 25,26 bzw. 27,28 der Scherenarme 6 bzw. 8 erstreckt.

Die Hydraulikzylinder 23,24 sind dabei einenends im Bereich ihrer Zylinder 33,34 an einem unteren, zwischen den jeweiligen Schwenklagern 19,19' der Scherenarme 6,8 befindlichen Querträger 30 (Fig. 1) über jeweilige Stützlager 31,32 festgelegt und jeweilige, über Fluiddruck in einer Mittellängsebene 35 der Kolben/Zylinder-Einheit 23,24 bewegliche Kolbenstangen 36,37 sind anderenends im jeweiligen Kopfbereich 39 über eine Kolbenstangenanlenkung 38 mit einem Spreizhebel 40 (Fig. 1) bzw. 40' (nicht sicht-

bar) verbunden.

Die vergrößerten Darstellungen gemäß Fig. 5 und Fig. 6 machen im Zusammenhang mit Fig. 9 deutlich, daß der Spreizhebel 40 als eine zwischen den jeweiligen inneren Schenkeln 25',26' bzw. 27',28' des jeweiligen Scherenarmpaares 5,6 bzw. 7,8 befindliche Hubschwinge 42 ausgebildet ist, die einenends einen zum Kreuzungsgelenk 4 bzw. 4' koaxialen Verbindungsteil 43, anderenends eine Druckrolle 44 und achsparallel zwischen dem Kreuzungsgelenk 4 und der Druckrollenachse 45 die in der Absenkstellung der Tischplattform 3 vorteilhaft oberhalb der Mittellängsebene 35 der Kolben/Zylinder-Einheit 23,24 befindliche Kolbenstangenanlenkung 38 aufweist (Fig. 2).

Mit einer derartigen Anlenkung der Hubschwinge 42 kann über die, die jeweiligen Zylinder 33,34 der Kolben/Zylinder-Einheit 23,24 im Endbereich nahe dem Schwenklager 19,19' der Scherenarme 6,8 festlegenden Stützlager 31,32 einerseits, die Kolbenstangenanlenkung 38 andererseits und die Druckrolle 44 zur Tischplattform 3 hin eine Wirkverbindung gebildet werden und der in vorteilhafter raumsparender Flachbauweise ausgebildete Scherenhubtisch 1 aus der in Fig. 2 veranschaulichten Absenkstellung in einer ersten Hubphase in die in Fig. 3 dargestellte Hubstellung H'dadurch verbracht werden, daß die Bewegung der Kolbenstangen 36,37 mit einer überlagerten Hub-Schwenk-Bewegung im Bereich der Hubschwingen 42,42' der Kreuzungsgelenke 4,4' anhebt, um dieses gleichzeitig die Hubschwinge 42,42' unter Abstützung der abrollenden Druckrolle 44 an der Unterseite der Tischplattform 3 eine Schwenkung der Hubschwingen 42,42' ausführt und über die Lager 18 und 20 an der Tischplattform 3 die Scheren-

noch dadurch erhöht werden kann, daß die jeweiligen Zylinder 33,34 im Bereich ihrer Stützlager 31,32 eine ebenfalls zur Mittellängsebene 35 asymmetrische, nach unten versetzte Abstützung 53 aufweisen und damit der Scherenhubtisch 1 an der jeweiligen Hubschwinge 42,42' in der Absenkstellung eine als Verbindungslinie zwischen der Anlenkung 38 und der Abstützung 53 dargestellte Druckwirkungsebene 52 darbietet.

Im Bereich der Hubschwinge 42 sind mit der Druckwirkungsebene 52 sowohl zwischen der jeweiligen Kolbenstangenanlenkung 38 und dem Kreuzungsgelenk 4 als auch zwischen der Kolbenstangenanlenkung 38 und der Druckrolle 44 jeweilige Krafteinleitungshebel gebildet, mit denen der Scherenhubtisch 1 in besonders raumsparender Flachbauweise so ausgebildet sein kann, daß die vorbeschriebene Spreizung bzw. Hebung mit lediglich einer Kolben/Zylinder-Einheit 23,24 in den jeweiligen Scherenarmpaaren 5,6 bzw. 7,8 durchführbar ist. Damit ist bei vermindertem technischen Aufwand ein hoher mechanischer Wirkungsgrad erzielbar und über einen in allen Hubstellungen H,H',H'' weitgehend konstanten Zylinderdruck eine gleichmäßige Hubbewegung über einen großen Hubweg, z.B. bis 1000 mm, erreichbar.

In Fig. 5 und 6 veranschaulichen vergrößerte Ausschnittsdarstellungen im Bereich der Hubschwinge 42 einen die wirksame Hebellänge zwischen der Kolbenstangenanlenkung 38 und dem Kreuzungsgelenk 4 bildenden Abstand 54, der sich ausgehend von der Absenkstellung H (Fig. 2) bis zur Stellung H' (Fig. 3, Fig. 6) ändert und bei weiter zunehmender Spreizung der Scherenarme 5,6 über die Anlage der Anschlagteile 46 im Formteil 47,47' bleibt dieser Abstand 54 als konstanter Hebelarm wirksam, bis die Tischplatt-

form 3 die Hubstellung H'' (Fig. 4, Fig. 5) erreicht hat.

In Fig. 7 und 8 ist die Hubschwinge 42 in einer deren vorteilhafte Ausbildung als ein querversteiftes Doppelglied 55 verdeutlichenden Einzeldarstellung veranschaulicht, wobei zwischen dessen Druckplatten 56,57 einenends eine im Bereich des Kreuzungsgelenks 4 zwischen den Verbindungsteilen 43 abgestützte Verbindungshülse 43', anderenends die auf einem Tragbolzen 44' befindliche Druckrolle 44 und zwischen diesen die Kolbenstangenanlenkung 38 vorgesehen sind.

Die Einbaulage der Hubschwinge 42 gemäß Fig. 9 verdeutlicht im Zusammenhang mit Fig. 8, daß die zwischen dem jeweiligen Scherenarmpaar 25',26' befindlichen Druckplatten 56,57 jeweils eine den Formteil 47,47' bildende Nut 58,58' (Fig. 8) aufweisen, in die jeweils ein als das Anschlagglied 46,46' vorgesehener und an den inneren Schenkeln 25',26' der Scherenarmpaare abgestützter Stift 59,59' einschwenkbar ist.

In zweckmäßiger Ausführung ist die Kolben/Zylinder-Einheit 23,24 im Bereich des jeweiligen Kopfbereiches 39 mit einer Einlaufmulde 60 (Fig. 6) versehen, so daß in der Absenkstellung gemäß Fig. 2 für die Druckrolle 44 ein die bodenparallele Ausrichtung der Kolben/Zylinder-Einheit 23,24 ermöglichender Freiraum erreicht ist und damit die Bauteile des Scherenhubtisches 1 auf eine die Hubhöhe H bildende Bauhöhe ohne Überstand absenkbar sind und auch bei beengten Platzverhältnissen eine gute Handhabbarkeit des Scherenhubtisches 1 ermöglicht ist.

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Ansprüche

1. 1. Scherenhubtisch, der zwischen einem bodenseitigen Unterrahmen (2) und einer oberen Tischplattform (3) zumindest ein Paar in einem Kreuzungsgelenk (4) miteinander verbundene Scherenarme (5,6; 7,8) aufweist, die in gegenüberliegenden Endbereichen (14,15;16,17) jeweils einenends ortsfest an einem Schwenklager (18,19) und anderenends über ein Loslager (20,21) am Unterrahmen (2) bzw. an der Tischplattform (3) abgestützt sind, wobei diese in einer nahe dem Unterrahmen befindlichen Ausgangsstellung im Bereich zumindest eines Scherenarmes (6,8) zur Einleitung eines Anfangshubes der Tischplattform (3) von einem am äußeren Kolbenstangenende (39) einer Kolben/Zylinder-Einheit (23,24) befindlichen Spreizhebel (40) mit Druckrolle (44) untergriffen ist, **dadurch gekennzeichnet,** daß der Spreizhebel (40) als eine zwischen jeweiligen inneren Schenkeln (25',26';27',28') zumindest eines der Scherenarmpaare (5,6;7,8) befindliche Hubschwinge (42) ausgebildet ist, die einenends einen zum Kreuzungsgelenk (4) koaxialen Verbindungsteil (43; 43'), anderenends die Druckrolle (44) und achs-

parallel zwischen dem Kreuzungsgelenk (4) und der Druckrollenachse (45) eine in der Ausgangsstellung oberhalb der Mittellängsebene (35) der Kolben/Zylinder-Einheit (26;27) befindliche Kolbenstangenanlenkung (38) aufweist.

2. Scherenhubtisch nach Anspruch 1, dadurch gekennzeichnet, daß mit der Hubschwinge (42) über eine den Zylinder (33,34) der Kolben/Zylinder-Einheit (23,24) im Endbereich nahe dem Schwenklager (18,19) des Scherenarmes (6,8) festlegende Abstützung (31,32) einerseits, die Kolbenstangenanlenkung (38) andererseits und die Druckrolle (44) eine Wirkverbindung zur Tischplattform (3) hin gebildet und diese mit jeweils nur einer je Scherenarmpaar (5,6;7,8) die Tischplattform (3) untergreifenden, in jeder Hubphase (H;H';H'') einen weitgehend konstanten Zylinderinnendruck aufweisenden Kolben/Zylinder-Einheit (23,24) in eine Hubendstellung (H'') verbringbar ist.

3. Scherenhubtisch nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die Hubschwinge (42) ein deren Schwenkwinkel in einer ersten Hubphase (H') über ein im Bereich der jeweiligen inneren Schenkel (25',26') abgestütztes Anschlagglied (46,46') begrenzendes Formteil (47,47') aufweist.

4. Scherenhubtisch nach einem der Ansprüche 1 bis 3, dadurch gekennzeichnet, daß die einen Stützbereich (48) an der Plattenunterseite aufweisende Tischplattform (3) von der an der Hubschwinge (42) befindlichen Druckrolle (44) derart untergriffen ist, daß in einer ersten, vom Einschwenken des Anschlaggliedes (46,46') in das Formteil (47,47') begrenzten Hubphase (H') ein Abstützungseingriff gebildet ist.

5. Scherenhubtisch nach einem der Ansprüche 1 bis 4, dadurch gekennzeichnet, daß der mit der Tischplattform (3) über ein Loslager (20) verbundene Scherenarm (6) über einen in seiner Länge (50) auf den Schwenkweg der Hubschwinge (42) abgestimmten Rollenuntergriff (51) mit der Tischplattform (3) verbunden ist.

6. Scherenhubtisch nach einem der Ansprüche 1 bis 5, dadurch gekennzeichnet, daß der Zylinder (33;34) der Kolben/Zylinder-Einheit (23;24) eine zu deren Mittellängsebene (35,35') beabstandete Abstützung (53;53') im Bereich des jeweiligen Schwenklagers (19,19') aufweist.

7. Scherenhubtisch nach einem der Ansprüche 1 bis 6, dadurch gekennzeichnet, daß die Hubschwinge (42) als ein querversteiftes Doppelglied (55) ausgebildet ist, zwischen dessen Druckplatten (56,57) die mit dem Verbindungsteil (43) im Bereich des Kreuzungsgelenks (4) und der Druckrolle (44) zusammenwirkende Kolbenstangenanlenkung (38) vorgesehen ist.

8. Scherenhubtisch nach einem der Ansprüche 1 bis 7, dadurch gekennzeichnet, daß die zwischen einem jeweiligen Scherenarmpaar (25',26';27',28') befindlichen Druckplatten (56,57) jeweils eine den Formteil (47,47') bildende Nut (58) aufweisen, in die jeweils ein als Anschlagglied (46,46') vorgesehener und an den inneren Schenkeln (25',26') der Scherenarmpaare (5,6) abgestützter Stift (59,59') einschwenkbar ist.

9. Scherenhubtisch nach einem der Ansprüche 1 bis 8, dadurch gekennzeichnet, daß die Druckplat-

ten (56,57) im Bereich des Kreuzungsgelenks (4) mit einer koaxialen Verbindungshülse (43') versehen sind.

10. Scherenhubtisch nach einem der Ansprüche 1 bis 9, dadurch gekennzeichnet, daß zwei Scherenarmpaare (5,6 und 7,8) mit jeweils einer Kolben/Zylinder-Einheit (23,24) und jeweils einer Hubschwinge (42,42') vorgesehen sind.

11. Scherenhubtisch nach einem der Ansprüche 1 bis 10, dadurch gekennzeichnet, daß die Tischplattform (3) im Abstützungsbereich (48) für die Stützrolle (44) mit einer unterseitigen Stabilisierungsplatte versehen ist.

12. Scherenhubtisch nach einem der Ansprüche 1 bis 11, dadurch gekennzeichnet, daß die Kolben/Zylinder-Einheit (23,24) im Bereich des Kolbenstangenendes (39) mit einer Einlaufmulde (60) versehen ist.

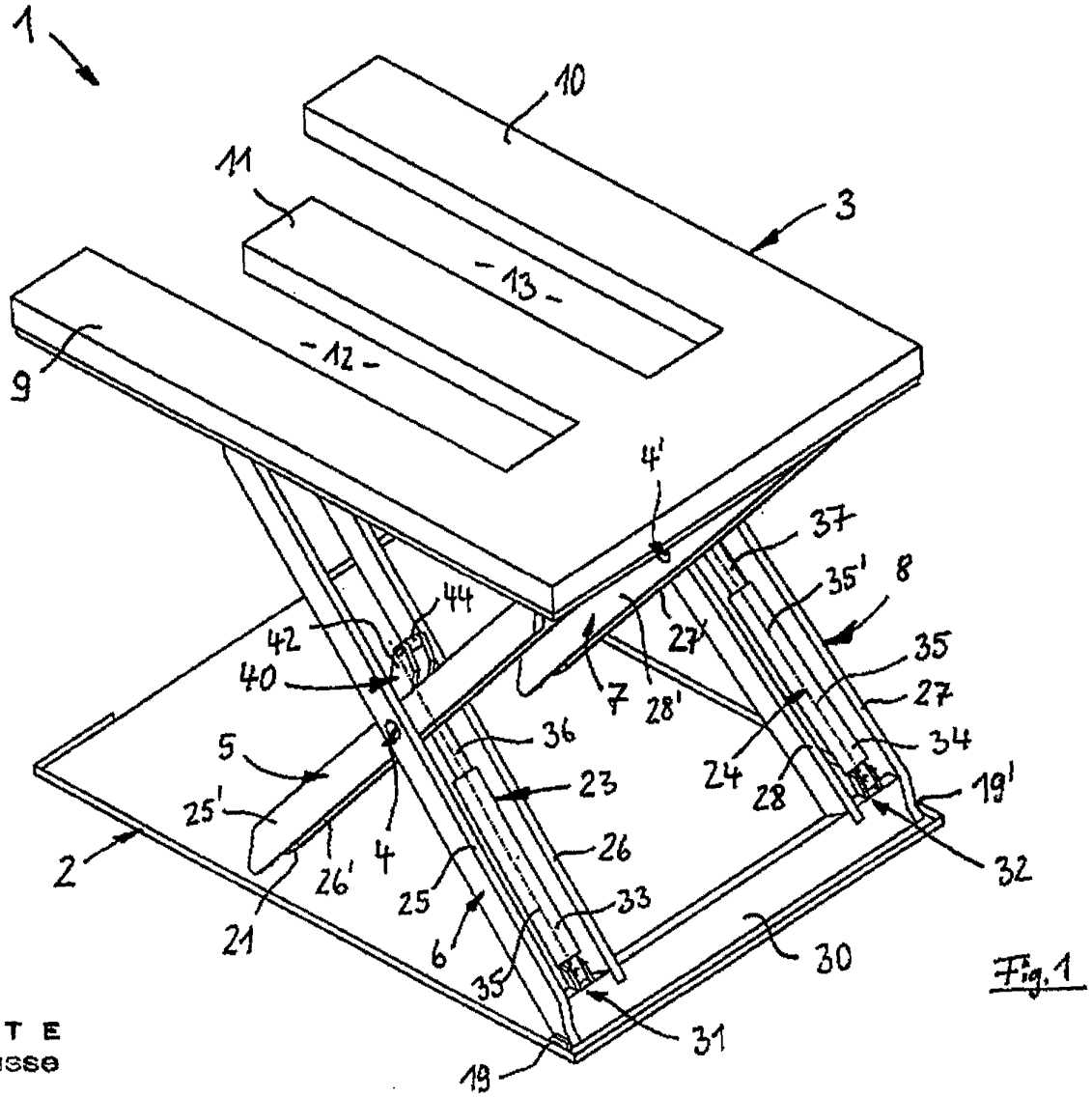


Fig. 1

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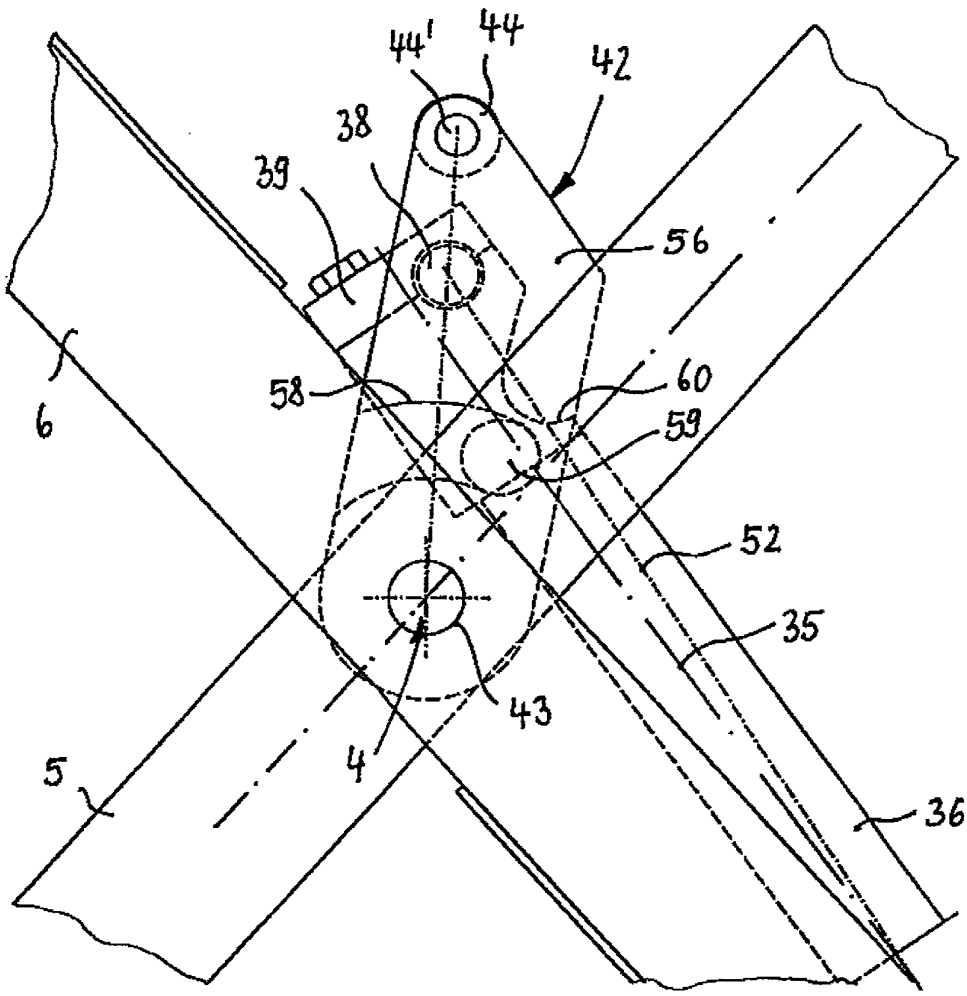


Fig. 5

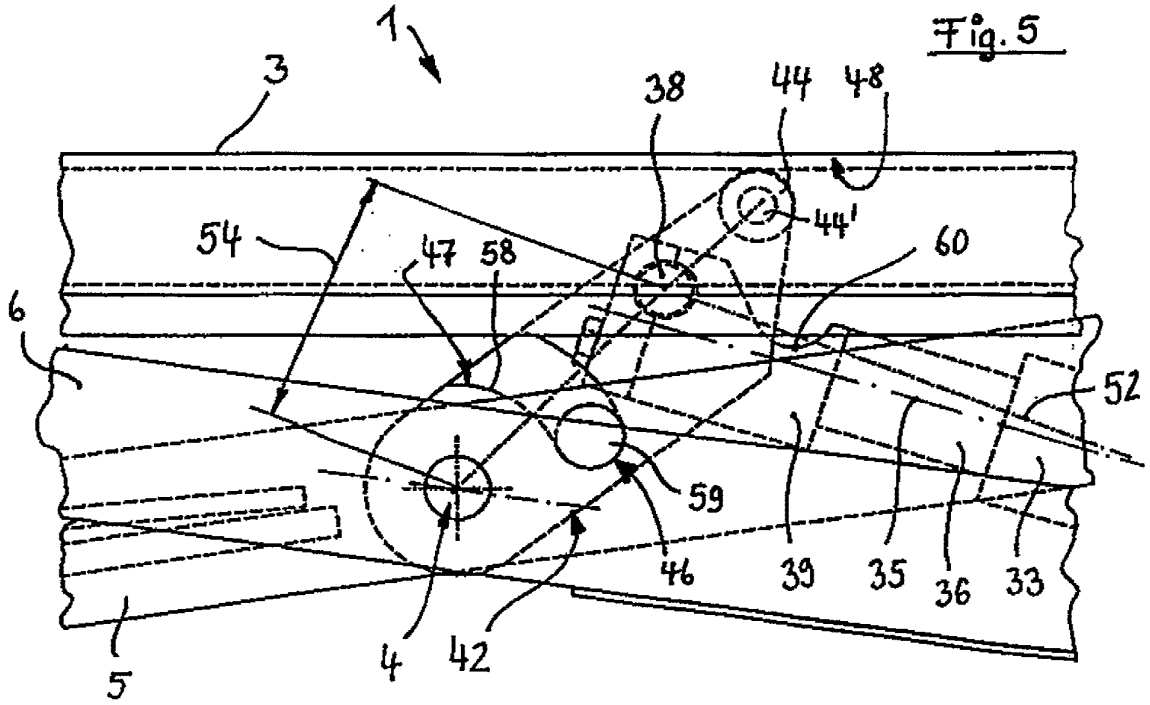


Fig. 6

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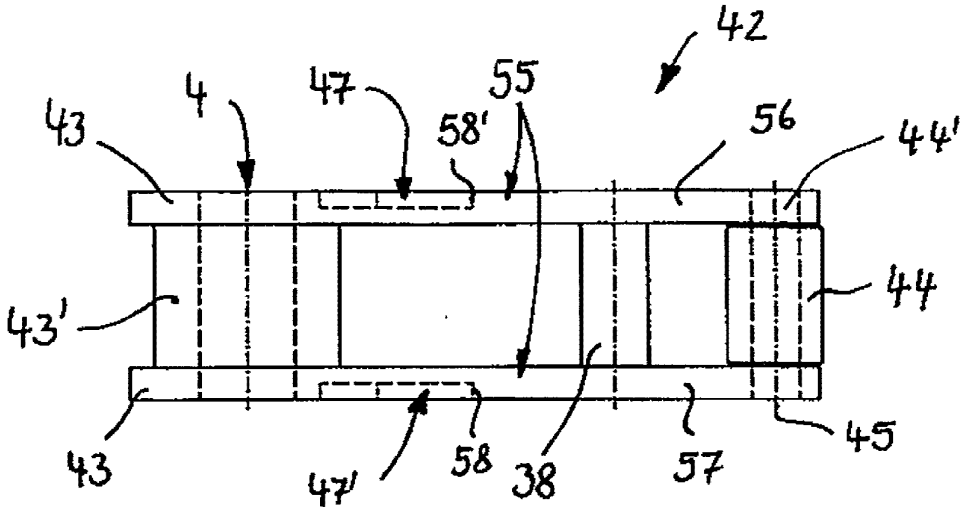


Fig. 7

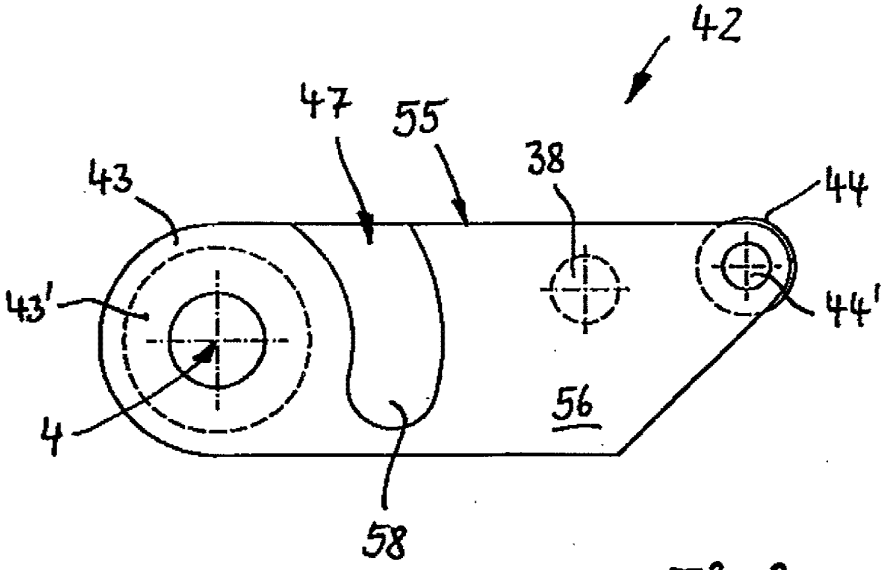


Fig. 8

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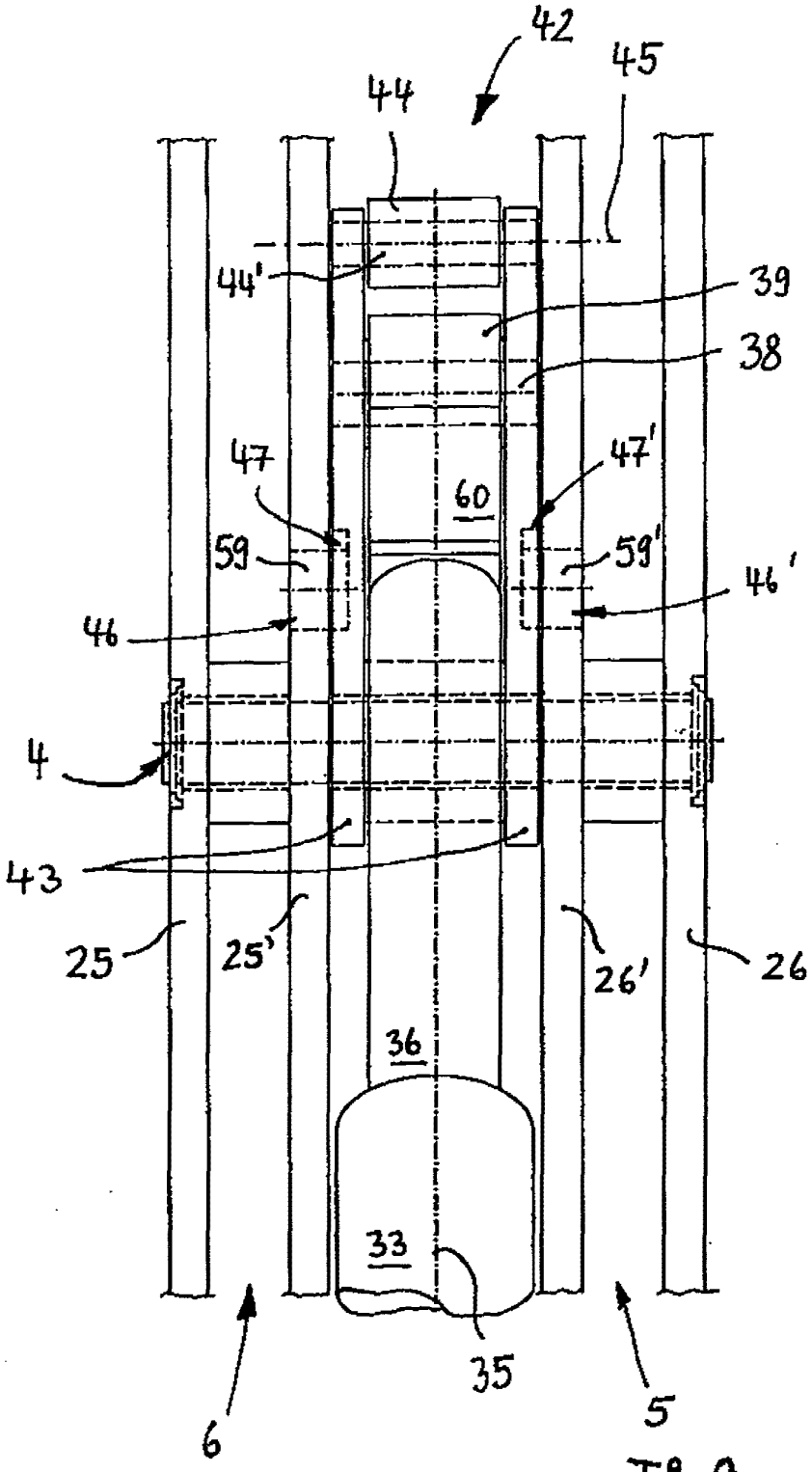


Fig. 9

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AMENDMENTS TO THE CLAIMS

1 (Currently Amended): A desktop workspace that adjusts vertically, comprising:

a work surface platform;

[[an]] a platform element sitting on the work surface platform, the platform element including an elevated platform surface above the work surface platform;

a base configured to sit on an existing platform; and

a height adjustment mechanism connecting the work surface platform and the base, the height adjustment mechanism including:

a first set of pivot arms that connect at a scissoring pivot point creating a scissoring motion when raising and lowering the work surface platform to various heights;

a second set of pivot arms;

an element that connects the first set of pivot arms to the second set of pivot arms;

a base pivot point fixed relative to the base and connecting the base and the first set of pivot arms;

a platform pivot point fixed relative to the work surface platform and connecting the work surface platform and the first set of pivot arms;

a sliding mechanism on an end of an arm of the first set of pivot arms between the end of the arm and either the work surface platform or the base; and

a [[gas]] spring that assists in elevation of the work surface platform by applying a force to one of the first set of pivot arms as part of the scissoring motion.

2 (Currently Amended): The desktop workspace of claim 1, wherein the platform element further includes four legs that support the elevated platform surface above the work surface platform, each of the four legs being proximate to one of four corners of the elevated platform.

3 (Currently Amended): The desktop workspace of claim 1, wherein the platform element includes four sides including a bottom side on the work surface platform, a top side forming the elevated platform surface and two sidewalls that support the elevated platform surface above the bottom side and the work surface platform.

4 (Original): The desktop workspace of claim 1, further comprising a computer monitor sitting on the elevated platform surface.

5 (Canceled).

6 (Currently Amended): The desktop workspace of claim 1 [[5]], wherein the [[gas]] spring extends between the work surface platform and the element that connects the first set of pivot arms to the second set of pivot arms.

7 (Currently Amended): The desktop workspace of claim 1, wherein one end of the [[gas]] spring is fixed to the work surface platform.

8 (Currently Amended): The desktop workspace of claim 1, wherein the [[gas]] spring is attached directly to the one of the first set of pivot arms.

9 (Currently Amended): The desktop workspace of claim 1, wherein the [[gas]] spring is attached to the scissoring pivot point.

10 (Currently Amended): The desktop workspace of claim 11 [[1]], wherein the gas spring is a first spring, the desktop workspace comprising a pair of springs attached to the height adjustment mechanism to assist in the elevation of the work surface platform, the pair of springs including the first spring and a second spring.

11 (Currently Amended): ~~The desktop workspace of claim 1~~

A desktop workspace that adjusts vertically, comprising:

a work surface platform;

an element sitting on the work surface platform, the element including an elevated platform surface above the work surface platform;

a base configured to sit on an existing platform; and

a height adjustment mechanism connecting the work surface platform and the base, the height adjustment mechanism including:

a set of pivot arms that connect at a scissoring pivot point creating a scissoring motion when raising and lowering the work surface platform to various heights;

a base pivot point fixed relative to the base and connecting the base and the set of pivot arms;

a platform pivot point fixed relative to the work surface platform and connecting the work surface platform and the set of pivot arms;

a sliding mechanism on an end of an arm of the set of pivot arms between the end of the arm and either the work surface platform or the base; and

a gas spring that assists in elevation of the work surface platform by applying a force to one of the set of pivot arms as part of the scissoring motion,

wherein the gas spring, the set of pivot arms, the base pivot point, and the platform pivot point align side-by-side when the desktop workspace is in a fully lowered position such that the desktop workspace adjusts vertically.

12 (Original): The desktop workspace of claim 1, wherein the sliding mechanism is a first sliding mechanism, the desktop workspace further comprising a second sliding mechanism, wherein either the first sliding mechanism or the second sliding mechanism is attached or slides along the work surface platform, and the other of the first sliding mechanism and the second sliding mechanism is attached to or slides along the base.

13 (Original): The desktop workspace of claim 1, wherein the scissoring motion when raising and lowering the work surface platform to various heights of the height adjustment mechanism moves the work surface platform in a straight vertical direction relative to the base.

14 (Currently Amended): The desktop workspace of claim 11 [[1]], wherein the gas spring acts as a locking device that holds the work surface platform at various vertical heights above the base.

15 (Currently Amended): The desktop workspace of claim 1, wherein the sliding mechanism includes a wheel mounted on the end of the arm of the first set of pivot arms.

16 (Currently Amended): A desktop workspace that adjusts vertically, comprising:

a work surface platform;

[[an]] a platform element sitting on the work surface platform, the platform element including an elevated platform surface above the work surface platform; and

a height adjustment mechanism configured raise and lower the work surface platform relative to an existing platform, the height adjustment mechanism including:

a first set of pivot arms that connect at a scissoring pivot point creating a scissoring motion when raising and lowering the work surface platform to various heights;

a second set of pivot arms;

an element that connects the first set of pivot arms to the second set of pivot arms;

bottom pivots directly locatable the existing platform;

platform pivot points fixed relative to the work surface platform and connecting the work surface platform and the first set of pivot arms;

a first sliding mechanism on an end of a first arm of the first set of pivot arms between the end of the first arm and the work surface platform;

a second sliding mechanism on an end of a second arm of the first set of pivot arms between the end of the second arm and the existing platform; and

a [[gas]] spring that assists in elevation of the work surface platform by applying a force to one of the first set of pivot arms as part of the scissoring motion.

17 (Currently Amended): The desktop workspace of claim 16, wherein the platform element further includes four legs that hold the elevated platform surface above the work surface platform, each of the four legs being proximate to one of four corners of the elevated platform.

18 (Currently Amended): The desktop workspace of claim 16, wherein the platform element includes four sides including a bottom side on the work surface platform, a top side forming the elevated platform surface and two sidewalls that hold the elevated platform surface above the bottom side and the work surface platform.

19 (Original): The desktop workspace of claim 16, further comprising a computer monitor sitting on the elevated platform surface.

20 (Canceled).

21 (Currently Amended): The desktop workspace of claim 16 [[20]], wherein the [[gas]] spring extends between the work surface platform and the element that connects the first set of pivot arms to the second set of pivot arms.

22 (Currently Amended): The desktop workspace of claim 16, wherein one end of the [[gas]] spring is fixed to the work surface platform.

23 (Currently Amended): The desktop workspace of claim 16, wherein the [[gas]] spring is attached directly to the first set of pivot arms.

24 (Currently Amended): The desktop workspace of claim 16, wherein the [[gas]] spring is attached to the scissoring pivot point.

25 (Currently Amended): The desktop workspace of claim 26 [[16]], wherein the gas spring is a first spring, the desktop workspace comprising a pair of springs attached to the height adjustment mechanism to assist in the elevation of the work surface platform, the pair of springs including the first spring and a second spring.

26 (Currently Amended): ~~The desktop workspace of claim 16~~

A desktop workspace that adjusts vertically, comprising:

a work surface platform;

an element sitting on the work surface platform, the element including an elevated platform surface above the work surface platform; and

a height adjustment mechanism configured raise and lower the work surface platform relative to an existing platform, the height adjustment mechanism including:

a set of pivot arms that connect at a scissoring pivot point creating a scissoring motion when raising and lowering the work surface platform to various heights;

bottom pivots directly locatable the existing platform;

platform pivot points fixed relative to the work surface platform and connecting the work surface platform and the set of pivot arms;

a first sliding mechanism on an end of a first arm of the set of pivot arms between the end of the first arm and the work surface platform;

a second sliding mechanism on an end of a second arm of the set of pivot arms between the end of the second arm and the existing platform; and

a gas spring that assists in elevation of the work surface platform by applying a force to one of the set of pivot arms as part of the scissoring motion,

wherein the gas spring, the set of pivot arms, the bottom pivots, and the platform pivot points align side-by-side when the desktop workspace is in a fully lowered position such that the desktop workspace adjusts vertically.

27 (Original): The desktop workspace of claim 16, wherein the scissoring motion when raising and lowering the work surface platform to the various heights of the height adjustment mechanism moves the work surface platform in a straight vertical direction relative to the existing platform.

28 (Currently Amended): The desktop workspace of claim 26 [[16]], wherein the gas spring acts as a locking device that holds the work surface platform at various vertical heights above the existing platform.

29 (Original): The desktop workspace of claim 16, wherein the first sliding mechanism includes a wheel between the end of the first arm and the existing platform, the wheel being directly rollable on top of the existing platform.

30 (Original): The desktop workspace of claim 29, wherein the wheel is a first wheel, wherein the second sliding mechanism includes a second wheel mounted on the end of the second arm.

31 (New): The desktop workspace of claim 22, wherein the spring is attached directly to the first set of pivot arms.

32 (New): The desktop workspace of claim 7, wherein the spring is attached directly to the one of the first set of pivot arms.

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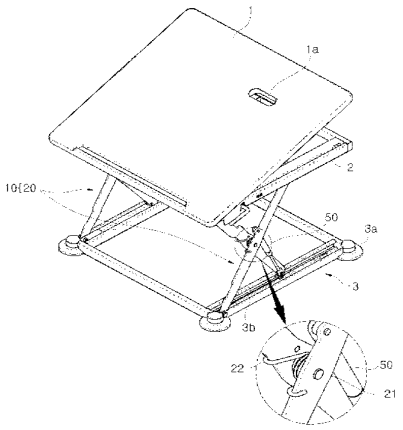
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(54) 고안의 명칭 **스탠딩 테이블**

(57) 요 약

스탠딩 테이블이 개시된다. 본 고안의 실시 예에 따른 스탠딩 테이블은 상판과; 상기 상판이 상부에 지지되는 상부지지대와; 상기 상부지지대 하부에 마련된 하부지지대와; 상호 X자 형태로 회전 가능하게 교차된 한 쌍의 링크암으로 구성되어 상기 하부지지대와 상부지지대 사이를 접철 가능하게 연결하는 크로스암과, 상기 크로스암의 링크암 사이의 회전을 허용 또는 차단하도록 마련된 높이조절용 잠금장치를 구비하는 높이조절유닛을 포함하고, 상기 크로스암은 상기 상부 및 하부지지대 사이의 양측에 한 쌍으로 마련되며, 상기 높이조절용 잠금장치는 한 쌍의 상기 크로스암의 동작을 개별적으로 조작하도록 한 쌍으로 마련될 수 있다.

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명 세 서

청구범위

청구항 1

상판과; 상기 상판이 상부에 지지되는 상부지지대와; 상기 상부지지대 하부에 마련된 하부지지대와; 상호 X자 형태로 회전 가능하게 교차된 한 쌍의 링크암으로 구성되어 상기 하부지지대와 상부지지대 사이를 접철 가능하게 연결하는 크로스암과, 상기 크로스암의 링크암 사이의 회전을 허용 또는 차단하도록 마련된 높이조절용 잠금장치를 구비하는 높이조절유닛을 포함하고,

상기 크로스암은 상기 상부 및 하부지지대 사이의 양측에 한 쌍으로 마련되며,

상기 높이조절용 잠금장치는 한 쌍의 상기 크로스암의 동작을 개별적으로 조작하도록 한 쌍으로 마련되고,

상기 높이조절용 잠금장치는 상기 크로스암을 구성하는 한 쌍의 상기 링크암 중 어느 하나에 마련된 제1걸림부와, 상기 제1걸림부에 걸릴 수 있도록 상기 상부지지대에 마련된 제2걸림부와, 상기 제1 및 제2걸림부 사이를 걸림 또는 걸림해제 해제 시킬 수 있도록 마련된 높이조절용 잠금레버를 포함하며,

상기 제1걸림부에는 복수의 제1톱니가 형성되도록 볼록하게 곡률진 제1톱니부가 마련되고, 상기 제2걸림부에는 상기 제1톱니 사이에 치합되는 복수의 제2톱니가 형성되도록 오목하게 곡률진 제2톱니부가 마련되며,

상기 제1톱니는 일측의 제1치면이 접선에 대하여 경사지고, 타측의 제2치면이 접선에 대하여 수직 방향으로 형성되도록 마련된 것을 포함하고,

상기 제2톱니는 상기 제1톱니의 제2치면에 대응하는 일측의 제1치면이 접선에 대하여 수직 방향으로 형성되고, 상기 제2톱니의 제1치면에 대응하는 타측의 제2치면이 접선에 대하여 경사지도록 마련된 것을 포함하는 스탠딩 테이블.

청구항 2

제 1항에 있어서,

한 쌍의 상기 높이조절용 잠금장치는 각각 높이조절용 손잡이부를 포함하여 손으로 조작되도록 마련되고,

한 쌍의 상기 높이조절용 손잡이부는 양손으로 동시에 조작할 수 있도록 상기 상판 저부 양측에 배치된 스탠딩 테이블.

청구항 3

삭제

청구항 4

제 1항에 있어서,

상기 크로스암은 한 쌍의 상기 링크암의 중도가 회전 가능하게 연결된 교차부를 구비하고,

상기 크로스암을 구성하는 한 쌍의 상기 링크암 사이는 쇼크업소버(shock absorber)를 통해 연결되되, 상기 쇼크업소버의 양단은 일단이 타단보다 상기 교차부에 더 인접하도록 배치되고,

상기 크로스암을 구성하는 한 쌍의 상기 링크암 사이는 상기 상판이 상승하는 방향으로 탄성부재를 통해 탄력적으로 지지된 스탠딩 테이블.

청구항 5

상판과; 상기 상판이 상부에 지지되는 상부지지대와; 상기 상부지지대 하부에 마련된 하부지지대와; 상호 X자 형태로 회전 가능하게 교차된 한 쌍의 링크암으로 구성되어 상기 하부지지대와 상부지지대 사이를 접철 가능하게 연결하는 크로스암과, 상기 크로스암의 링크암 사이의 회전을 허용 또는 차단하도록 마련된 높이조절용 잠금

장치를 구비하는 높이조절유닛을 포함하고,

상기 크로스암은 상기 상부 및 하부지지대 사이의 양측에 한 쌍으로 마련되며,

상기 높이조절용 잠금장치는 한 쌍의 상기 크로스암의 동작을 개별적으로 조작하도록 한 쌍으로 마련되고,

상기 상부지지대에 대해 상기 상판의 경사를 가변시키도록 마련된 경사조절유닛을 더 포함하되,

상기 상판은 일단이 상기 상부지지대에 회전 가능하게 결합되고,

상기 경사조절유닛은 상기 상부지지대에 대한 상기 상판의 회전을 허용 또는 차단하도록 경사조절용 손잡이부를 구비하여 상기 상판 배면에 위치되는 경사조절용 잠금레버와, 상기 경사조절용 손잡이부를 상기 상판 상부로부터 손을 넣어 잡을 수 있도록 상기 경사조절용 손잡이부 위치에 대응하는 상기 상판을 관통하는 조작구멍을 포함하는 스탠딩 테이블.

청구항 6

상판과; 상기 상판이 상부에 지지되는 상부지지대와; 상기 상부지지대 하부에 마련된 하부지지대와; 상호 X자 형태로 회전 가능하게 교차된 한 쌍의 링크암으로 구성되어 상기 하부지지대와 상부지지대 사이를 접철 가능하게 연결하는 크로스암과, 상기 크로스암의 링크암 사이의 회전을 허용 또는 차단하도록 마련된 높이조절용 잠금장치를 구비하는 높이조절유닛을 포함하고,

상기 크로스암은 상기 상부 및 하부지지대 사이의 양측에 한 쌍으로 마련되며,

상기 높이조절용 잠금장치는 한 쌍의 상기 크로스암의 동작을 개별적으로 조작하도록 한 쌍으로 마련되고,

상기 상부지지대에 대해 상기 상판의 경사를 가변시키도록 마련된 경사조절유닛을 더 포함하되,

상기 상판은 일단이 상기 상부지지대에 회전 가능하게 결합되고,

상기 경사조절유닛은 상기 상판을 경사가 높아지는 방향으로 탄성지지 하도록 상기 상판 저부에 위치하는 걸쇠와, 상기 걸쇠가 단계적으로 걸릴 수 있게 마련된 복수의 제1걸이홈을 구비하여 상기 상판 배면에 고정된 걸림판과, 상기 복수의 제1걸이홈과 같은 간격으로 나란히 배치된 복수의 제2걸이홈을 구비하여 상기 제2걸이홈들이 상기 제1걸이홈들과 일치된 상태로 정렬이 가능하도록 상기 걸림판에 슬라이딩 가능하게 장착된 슬라이딩부재와, 상기 슬라이딩부재를 상기 걸쇠의 탄성지지방향과 반대방향으로 가압하도록 마련된 가압수단을 포함하는 스탠딩 테이블.

고안의 설명

기 술 분 야

[0001] 본 고안은 앉은 자세는 물론 서 있는 자세에서도 편안하게 작업을 수행할 수 있도록 마련된 스탠딩 테이블에 관한 것이다.

배 경 기 술

[0002] 책상이나 작업대 등으로 사용이 가능한 테이블은 통상 상판의 높이가 앉은 자세에 맞게 고정된 것이 일반적이다.

[0003] 그러나 앉은 자세로 장시간 앉아 있는 상태에서는 목이나 허리 등에 쉽게 무리가 갈 수 있기 때문에, 상판 높이가 고정된 테이블은 장시간 사용하기에 불편한 점이 많았다.

[0004] 따라서 최근 테이블 중에는 상판의 높낮이를 조절할 수 있도록 함으로써, 앉은 자세에서는 물론 서 있는 상태에서도 테이블을 이용하여 작업을 편안하게 수행할 수 있도록 한 스탠딩 타입이 등장하고 있다.

[0005] 공개특허공보 제10-2012-0129041호는 상판의 높낮이를 조절할 수 있도록 마련된 스탠딩 테이블의 일례를 제시하고 있다.

선행기술문헌

특허문헌

[0006] (특허문헌 0001) 공개특허공보 제10-2012-0129041호

고안의 내용

해결하려는 과제

[0007] 그러나 상기 공보에 개시된 스탠딩 테이블은 상판이 수직방향으로 세워진 지지대에 상하로 슬라이딩 가능한 상태에서 볼트로 고정되어 있고, 이에 따라 지지대에 상판의 높낮이를 조절하기 위해 볼트를 풀고 다시 조여야 하므로, 테이블의 이용도중에 상판의 높낮이를 자주 조절하기가 어려웠다.

[0008] 또한 지면과 평행한 상태의 상판을 단순히 높낮이만 조절할 수 있게 마련된 종래 스탠딩 테이블은 경사를 갖는 지지면은 제공을 할 수가 없어 다양한 작업시 편리하게 활용되는데 한계가 있었다.

[0009] 본 고안의 실시 예는 상판의 높낮이를 간편하게 조절할 수 있도록 마련된 스탠딩 테이블을 제공하는 것이다.

[0010] 또한 상판의 높이 조절에 따른 안전성을 충분히 확보할 수 있도록 마련된 스탠딩 테이블을 제공하는 것이다.

[0011] 또한 상판의 높이는 물론 경사까지 조절할 수 있도록 마련되어 다양한 작업에 보다 편리하게 사용될 수 있도록 마련된 스탠딩 테이블을 제공하는 것이다.

[0012] 또한 상판의 높이 또는 경사 조절에 따른 동작 효율성을 향상시킬 수 있도록 스탠딩 테이블을 제공하는 것이다.

과제의 해결 수단

[0013] 본 고안의 일 측면에 따르면, 상판과; 상기 상판이 상부에 지지되는 상부지지대와; 상기 상부지지대 하부에 마련된 하부지지대와; 상호 X자 형태로 회전 가능하게 교차된 한 쌍의 링크암으로 구성되어 상기 하부지지대와 상부지지대 사이를 접철 가능하게 연결하는 크로스암과, 상기 크로스암의 링크암 사이의 회전을 허용 또는 차단하도록 마련된 높이조절용 잠금장치를 구비하는 높이조절유닛을 포함하고, 상기 크로스암은 상기 상부 및 하부지지대 사이의 양측에 한 쌍으로 마련되며, 상기 높이조절용 잠금장치는 한 쌍의 상기 크로스암의 동작을 개별적으로 조작하도록 한 쌍으로 마련된 스탠딩 테이블이 제공될 수 있다.

[0014] 한 쌍의 상기 높이조절용 잠금장치는 각각 높이조절용 손잡이부를 포함하여 손으로 조작되도록 마련되고, 한 쌍의 상기 높이조절용 손잡이부는 양손으로 동시에 조작할 수 있도록 상기 상판 저부 양측에 배치될 수 있다.

[0015] 상기 높이조절용 잠금장치는 상기 크로스암을 구성하는 한 쌍의 상기 링크암 중 어느 하나에 마련된 제1걸림부와, 상기 제1걸림부에 걸릴 수 있도록 상기 상부지지대에 마련된 제2걸림부와, 상기 제1 및 제2걸림부 사이를 걸림 또는 걸림 해제 시킬 수 있도록 마련된 높이조절용 잠금레버를 포함하며, 상기 제1걸림부에는 복수의 제1톱니가 형성되도록 볼록하게 곡률진 제1톱니부가 마련되고, 상기 제2걸림부에는 상기 제1톱니 사이에 치합되는 복수의 제2톱니가 형성되도록 오목하게 곡률진 제2톱니부가 마련되며, 상기 제1톱니는 일측의 제1치면이 접선에 대하여 경사지고, 타측의 제2치면이 접선에 대하여 수직 방향으로 형성되도록 마련된 것을 포함하고, 상기 제2톱니는 상기 제1톱니의 제2치면에 대응하는 일측의 제1치면이 접선에 대하여 수직 방향으로 형성되고, 상기 제2톱니의 제1치면에 대응하는 타측의 제2치면이 접선에 대하여 경사지도록 마련될 수 있다.

[0016] 상기 크로스암을 구성하는 한 쌍의 상기 링크암 사이는 제1쇼크업소버(shock absorber)를 통해 연결되되, 상기 제1쇼크업소버의 양단은 일단이 타단보다 상기 교차부에 더 인접하도록 배치되고, 상기 크로스암을 구성하는 한 쌍의 상기 링크암 사이는 상기 상판이 상승하는 방향으로 탄성부재를 통해 탄력적으로 지지될 수 있다.

[0017] 상기 스탠딩 테이블은 상부지지대에 대해 상기 상판의 경사를 가변시키도록 마련된 경사조절유닛을 더 포함하되, 상기 상판은 일단이 상기 상부지지대에 회전 가능하게 결합되고, 상기 경사조절유닛은 상기 상부지지대에 대한 상기 상판의 회전을 허용 또는 차단하도록 경사조절용 손잡이부를 구비하여 상기 상판 배면에 위치되는 경사조절용 잠금레버와, 상기 경사조절용 손잡이부를 상기 상판 상부로부터 손을 넣어 잡을 수 있도록 상기 경사조절용 손잡이부 위치에 대응하는 상기 상판을 관통하는 조작구멍을 포함할 수 있다.

[0018] 상기 스탠딩 테이블은 상부지지대에 대해 상기 상판의 경사를 가변시키도록 마련된 경사조절유닛을 더 포함하되, 상기 상판은 일단이 상기 상부지지대에 회전 가능하게 결합되고, 상기 경사조절유닛은 상기 상판을

경사가 높아지는 방향으로 탄성지지 하도록 상기 상판 저부에 위치하는 결쇠와, 상기 결쇠가 단계적으로 걸릴 수 있게 마련된 복수의 제1걸이홈을 구비하여 상기 상판 배면에 고정된 걸림판과, 상기 복수의 제1걸이홈과 같은 간격으로 나란히 배치된 복수의 제2걸이홈을 구비하여 상기 제2걸이홈들이 상기 제1걸이홈들과 일치된 상태로 정렬이 가능하도록 상기 걸림판에 슬라이딩 가능하게 장착된 슬라이딩부재와, 상기 슬라이딩부재를 상기 결쇠의 탄성지지방향과 반대방향으로 가압하도록 마련된 가압수단을 포함할 수 있다.

고안의 효과

[0019] 본 고안의 실시 예에 따른 스탠딩 테이블은 높이조절용 잠금레버를 손으로 조작하는 방식을 통해 상판의 높이를 간편하게 조절할 수 있다.

[0020] 또 본 고안의 실시 예에 따른 스탠딩 테이블은 상판의 높이 조절을 위한 한 쌍의 크로스암이 한 쌍의 높이조절용 손잡이부에 의해 개별적으로 동작하게 되어 상판의 높이조절과정에서 양손이 모두 높이조절용 손잡이부를 잡은 상태를 유지하도록 함으로써, 상판의 승강동작시 이용자의 손이 상부지지대와 하부지지대 사이에 끼게 되는 것을 거의 완벽하게 방지하여 상판의 높이 조절에 따른 안전성을 충분히 확보할 수 있다.

[0021] 또 본 고안의 실시 예에 따른 스탠딩 테이블은 높이조절유닛과 경사조절유닛에 의해 상판의 높이는 물론 경사까지 조절할 수 있게 되어 다양한 작업에 보다 편리하게 사용될 수 있다.

도면의 간단한 설명

[0022] 도 1은 본 고안의 일 실시 예에 따른 스탠딩 테이블의 사시도로, 상판이 저부로 하강된 상태를 나타낸 것이다.

도 2는 도 1에서 상판이 상승된 상태를 나타낸 것이다.

도 3은 도 2에서 상판의 경사가 세워진 상태를 나타낸 것이다.

도 4는 도 2의 측면도이다.

도 5는 도 2의 측면도로, 높이조절용 잠금장치의 구조를 보이기 위해 상부지지대의 일부가 제거되도록 한 것이다.

도 6은 높이조절용 잠금장치에 마련된 제1톱니와 제2톱니 사이의 걸림구조를 확대 도시한 것이다.

도 7은 도 5의 상태에서 상판이 하강된 상태를 나타낸 것으로, 높이조절용 잠금장치의 구조를 보이기 위해 상부지지대와 크로스암의 일부가 제거되도록 한 것이다.

도 8은 본 고안의 일 실시 예에 따른 스탠딩 테이블의 저면 사시도이다.

도 9는 본 고안의 일 실시 예에 따른 스탠딩 테이블에서 경사조절유닛 쪽 구조를 발취 도시한 측면도이다.

도 10은 도 9에서 경사조절용 잠금레버를 조작하여 경사조절유닛의 잠금이 해제된 상태를 나타낸 것이다.

도 11은 도 10의 상태에서 상판의 경사가 커지도록 조절된 상태를 나타낸 것이다.

고안을 실시하기 위한 구체적인 내용

[0023] 이하에서는 본 고안의 실시 예를 첨부 도면을 참조하여 상세히 설명한다. 이하의 실시 예는 본 고안이 속하는 기술분야에서 통상의 지식을 가진 자에게 본 고안의 사상을 충분히 전달하기 위해 제시하는 것이다. 본 고안은 여기서 제시한 실시 예만으로 한정되지 않고 다른 형태로 구체화될 수도 있다. 도면은 본 고안을 명확히 하기 위해 설명과 관계 없는 부분의 도시를 생략하고, 이해를 돕기 위해 구성요소의 크기를 다소 과장하여 표현할 수 있다.

[0024] 도 1 내지 도 3에 도시된 바와 같이, 본 실시 예에 따른 스탠딩 테이블은 상판(1)과, 상판(1)이 상부에 지지되도록 마련된 상부지지대(2)와, 상부지지대(2) 하부에 마련된 하부지지대(3)를 구비한다.

[0025] 도면에서 상판(1)은 통상의 테이블에 적용되는 것과 같이 사각의 판 형태로 마련되어 있으나, 원형, 삼각, 오각 등 상판의 형태에는 특별한 제한이 없으며, 상판의 재질 역시 나무, 플라스틱, 금속, 아크릴 등의 다양한 소재로부터 선택될 수 있다. 즉 상판(1)의 형상과 재질은 스탠딩 테이블의 이용 목적이나 제작자가 원하는 디자인에 따라 다양한 형상과 재질을 통해 구성될 수 있다.

[0026] 상부지지대(2)는 상판(1) 저면을 지지하도록 마련되며, 하부지지대(3)는 스탠딩 테이블이 놓여지는 곳의 바닥면

에 지지되도록 상부지지대(2) 저부에 위치하게 된다.

[0027] 스탠딩 테이블은 책상과 같은 다른 물건 위에 올려 놓은 상태에서 이용하는 것이 바람직하지만, 단독으로 바닥에 놓은 상태에서도 협탁 등과 같은 용도로 이용은 가능하다.

[0028] 상부 및 하부지지대(2,3)는 각각 사각의 틀 형태로 마련될 수 있으며, 상부지지대(2)는 하부지지대(3) 상부에 지지가 가능하도록 마련될 수 있다.

[0029] 틀 형태로 마련되는 하부지지대(3)는 각 모서리 쪽에 일체로 마련된 대략 원판 형태의 받침부(3a)를 통해 바닥면에 대한 지지력을 높일 수 있게 된다.

[0030] 바닥면에 대한 지지력을 높일 수 있도록 각 받침부(3a) 저면에는 큐방이나 바닥면과의 마찰을 증대시키기 위한 마찰부재 등이 설치될 수 있다. 하부지지대(3)는 본 실시 예와 달리 평판 형태로도 대체될 수 있다.

[0031] 상부 및 하부지지대(2,3)는 나무, 플라스틱, 금속 등의 다양한 소재를 통해 마련될 수 있으나, 강성을 고려했을 때, 상부 및 하부지지대(2,3)의 소재로는 금속이나 강화 플라스틱 등의 더욱 적합할 수 있다.

[0032] 상판(1)은 높이조절유닛(10)을 통해 하부지지대(3)와 상부지지대(2) 사이의 간격이 변화됨에 따라 높낮이가 조절될 수 있게 된다.

[0033] 도 4 내지 도 7에 도시된 바와 같이, 높이조절유닛(10)은 하부지지대(3)와 상부지지대(2) 사이를 접철 가능하게 연결하도록 마련된 크로스암(20)을 포함하고, 크로스암(20)은 상호 X자 형태로 회전 가능하게 교차된 한 쌍의 링크암(30,40)으로 구성될 수 있다.

[0034] 크로스암(20)은 상부 및 하부지지대(2,3) 사이의 양측에 한 쌍으로 배치되어 상부 및 하부지지대(2,3) 사이가 양쪽이 균형을 이룬 상태에서 안정적으로 간격조절이 가능하도록 마련될 수 있다.

[0035] 크로스암(20)을 구성하는 한 쌍의 링크암(30,40)은 상부 일단이 상부지지대(2)에 회전 가능하게 결합되고 하부 타단이 하부지지대(3)에 수평방향으로 슬라이딩 가능하게 결합된 제1링크암(30)과, 하부 일단이 하부지지대(3)에 회전 가능하게 결합되고 상부 타단이 상부지지대(2)에 수평방향으로 슬라이딩 가능하게 결합된 제2링크암(40)으로 구분될 수 있다.

[0036] 하부지지대(3) 일측에는 제1링크암(30)의 하부 쪽 단부가 수평방향으로 슬라이딩 가능하게 결합되도록 제1수평레일(3b)(도 2,3 참조)이 형성될 수 있고, 제1수평레일(3b)의 위치에 대응하는 상부지지대(2)의 일측으로는 제2링크암(40)의 상부 쪽 단부가 수평방향으로 슬라이딩 가능하게 결합되도록 제2수평레일(2b)(도 7 참조)이 형성될 수 있다.

[0037] 따라서 상판(1)은 크로스암(20)들의 접철 동작에 따라 승강하면서 높이가 가변될 수 있게 된다.

[0038] 크로스암(20)의 접철동작시 상판(1)이 수평방향으로는 이동됨이 없이 그 위치 그대로 승강 동작할 수 있도록 크로스암(20)을 구성하는 한 쌍의 링크암(30,40)의 양단의 위치는 수직방향을 따라 동일선상에 위치하도록 마련되는 것이 바람직하다.

[0039] 따라서 수평방향으로 이동됨이 없이 승강 동작하는 상판(1)은 전후방으로 별도의 공간을 확보할 필요가 없게 되어 공간활용도 측면에서도 유리한 이점을 갖게 된다.

[0040] 또한 상판(1)의 승강동작이 진동 없는 상태에서 안정적으로 이루어질 수 있도록 크로스암(20)에는 제1 쇼크업소버(shock absorber)(50)가 채용될 수 있다.

[0041] 이때 크로스암(20)을 구성하는 링크암(30,40)의 슬라이딩 동작에 간섭됨이 없도록 하고, 또 크로스암(20)의 접철 구간 전 구간에 걸쳐 효과적인 완충작용을 수행할 수 있도록 하면서도 상판(1)의 승강 동작시 제1 쇼크업소버(50)가 한 쪽 링크암에 인접한 상태를 유지할 수 있도록 제1쇼크업소버(50)는 양단이 한 쌍의 링크암(30,40)의 교차부 일측으로 교차부의 상부와 하부에 각각 회전 가능하게 결합되며, 제1쇼크업소버(50)의 양단 중 일단은 타단보다 링크암(30,40) 사이의 교차부에 더 인접하도록 배치될 수 있다.

[0042] 도 4에서 미설명 부호 21은 링크암(30,40) 사이의 교차부를 회전 가능하게 연결하는 회전축이고, 51 및 52는 제1쇼크업소버(50)의 양단을 각 링크암(30,40)에 회전 가능하게 결합시키는 회전결합편을 가리킨다.

[0043] 또한 높이조절유닛(10)은 크로스암(20)을 구성하는 한 쌍의 링크암(30,40) 사이의 회전을 허용 또는 차단하도록 마련된 높이조절용 잠금장치(60)를 포함할 수 있다.

[0044] 높이조절용 잠금장치(60)는 크로스암(20)을 구성하는 제1 및 제2링크암(30,40) 중 제1링크암(30)에 마련된 제1걸림부(70)와, 제1걸림부(70)에 걸릴 수 있도록 상부지지대(2)에 마련된 제2걸림부(80)와, 제1 및 제2걸림부(70,80) 사이가 걸림 또는 걸림 해제 상태로 전환시키도록 마련된 높이조절용 잠금레버(90)를 포함하도록 구성될 수 있다.

[0045] 높이조절용 잠금레버(90)는 상판(1)의 측방 저부에 상판(1)의 측방 쪽 변과 거의 평행하게 배치되는 높이조절용 손잡이부(91)와, 높이조절용 손잡이부(91)로부터 상판(1) 안쪽으로 연장된 작동부(92)를 구비할 수 있다. 작동부(92)는 제1회전축(93)을 통해 상부지지대(2)에 상하방향으로 회전 가능하게 결합될 수 있다.

[0046] 제1걸림부(70)는 부채꼴 형태로 형성되어 제1링크암(30) 상단에 고정될 수 있으며, 볼록한 곡면을 이루는 제1걸림부(70)의 일측 둘레는 복수의 제1톱니(72)를 구비하는 제1톱니부(71)를 이룰 수 있다. 제1걸림부(70)는 제1링크암(30)과 함께 회전하게 되는데, 제1톱니부(71)가 상판(1)이 상승된 상태에서 저부를 향하고, 상판(1)이 하강함에 따라 차츰 후방 측을 향하도록 배치될 수 있다.

[0047] 제2걸림부(80)는 제1회전축(93)과 제1걸림부(70) 사이의 상부지지대(2)에 제2회전축(81)을 통해 회전 가능하게 결합될 수 있다. 또 제2걸림부(80)는 제2회전축(81) 쪽에서 제1걸림부(70) 저부로 연장된 연장부(82)를 구비하며, 연장부(82)에 있어서 오목한 곡면을 이루는 상측은 제1톱니(72)와 이물림 될 수 있도록 복수의 제2톱니(85)가 마련된 제2톱니부(84)를 형성할 수 있다.

[0048] 제2회전축(81) 타측으로 제1회전축(93) 쪽 제2걸림부(80)에는 높이조절용 잠금레버(90)의 작동부(92)에 걸릴 수 있게 작동부(92)와 교차하도록 걸림바(83)가 연장될 수 있다.

[0049] 또 제2걸림부(80)는 제1탄성부재(61)를 통해 제2톱니부(84) 쪽이 제1톱니부(71) 쪽으로 탄성지지 되도록 설치될 수 있다. 제1탄성부재(61)는 일단이 상부지지대(2)에 지지되고 타단이 제2걸림부(80)에 지지되도록 마련된 코일스프링으로 구성될 수 있다.

[0050] 따라서 이와 같은 구조에서는 이용자가 높이조절용 잠금레버(90)의 높이조절용 손잡이부(91)를 손으로 잡아 상판(1) 배면 쪽으로 들어올리게 되면, 제1탄성부재(61)가 압축되면서 제2회전축(81)을 중심으로 제2걸림부(80)의 걸림바(83)는 상부 쪽으로 들려지게 되는 반면, 연장부(82) 쪽이 저부로 내려가게 되면서 제1톱니부(71)에 대한 제2톱니부(84)의 치합 상태가 해제된다. 따라서 이때는 크로스암(20)을 구성하는 링크암(30,40) 사이의 회전이 허용됨에 따라 상판(1)은 크로스암(20)의 접철 동작을 통해 승강되면서 높이 조절이 가능한 상태가 된다.

[0051] 이 상태에서 상판(1)을 이용자가 원하는 높이로 승강시킨 상태에서 이용자가 높이조절용 손잡이부(91)에 가해졌던 힘을 제거하게 되면, 제1탄성부재(61)의 복원력에 의해 제2회전축(81)을 중심으로 제2걸림부(80) 일측의 걸림바(83)는 아래로 내려지게 되는 반면, 연장부(82)가 상부로 들어올려 지면서 제2톱니부(84)는 다시 제1톱니부(71)에 이물림 되고, 이에 따라 상판(1)은 다시 승강동작이 잠김 상태를 유지하게 된다.

[0052] 또한 적어도 일부의 제1톱니(72)들은 일측의 제1치면(72a)이 접선에 대하여 경사지고, 타측의 제2치면(72b)이 접선에 대하여 수직 방향으로 형성되도록 마련되고, 적어도 일부의 제2톱니(85)들은 치합 상태에서 제1톱니(72)의 제2치면(72b)에 대응하는 일측의 제1치면(85a)이 접선에 대하여 수직 방향으로 형성되고, 제1톱니(72)의 제1치면(72a)에 대응하는 타측의 제2치면(85b)이 접선에 대하여 경사지도록 마련될 수 있다.

[0053] 이와 같이 구성된 제1 및 제2톱니(72,85)는 접선에 대하여 수직한 제1톱니(72)의 제1치면(72a)과 제2톱니(85)의 제2치면(85b) 사이를 통해 상호 간의 걸림력이 향상되어 잠금 상태에서 둘 사이의 이물림이 해제될 우려가 줄어들고, 접선에 경사진 제1톱니(72)의 제2치면(72b)과 제2톱니(85)의 제1치면(85a) 사이를 통해 잠금 해제 동작시 둘 사이의 이물림 상태가 신속하게 해제될 수 있게 된다.

[0054] 따라서 본 실시 예에 따른 스탠딩 데이블은 상판(1) 위에 올려지는 물건의 무게가 과도한 경우에도 상승된 상태의 상판(1)이 물건을 지지한 상태를 안전하게 유지할 수 있게 되고, 높이조절유닛(10)의 잠금상태도 신속하게 해제시킬 수 있게 된다.

[0055] 또한 크로스암(20)을 구성하는 한 쌍의 링크암(30,40) 사이에는 상판(1)이 상승하는 방향으로 링크암(30,40) 사이를 탄성지지 하기 위한 제2탄성부재(22)(도 4 참조)가 마련될 수 있다.

[0056] 제2탄성부재(22)로는 중앙이 힌지축(21)에 끼워진 상태에서 양단이 힌지축(21) 상부의 제1링크암(30)과 제2링크암(40)에 각각 연결된 토션스프링이 채용될 수 있다.

[0057] 제2탄성부재(22)를 통해 제1 및 제2링크암(30,40) 사이가 상판(1)의 상승방향으로 탄지된 상태에서는 높이조절

용 잠금장치(60)에 의해 링크암(30,40) 사이의 회전이 허용된 상태에서 별다른 외력을 가하지 않더라도 상판(1)의 상승동작이 유발되어 상판(1) 위에 무거운 물건이 올려져 있는 상태에서도 상판(1)을 원활하게 상승시킬 수 있게 된다. 따라서 제2탄성부재(22)는 링크암(30,40) 사이의 회전이 허용된 상태에서 제1쇼크업소버(5)에 의해 상승하게 되는 상판(1)의 상승동작을 스타팅 시키는 역할을 수행하게 된다.

[0058] 크로스암(20)은 상판(1)의 승강동작을 안정적으로 지지하도록 상부 및 하부지지대(2,3) 사이의 양측에 한 쌍으로 배치될 수 있다.

[0059] 그리고 크로스암(20)의 회전동작을 구속하는 높이조절용 잠금장치(60)는 각 크로스암(20)의 동작을 개별적으로 조작하도록 한 쌍으로 마련되며, 각 높이조절용 잠금레버(90)의 높이조절용 손잡이부(91)는 양손으로 동시에 조작할 수 있도록 상판(1) 저부 양측으로 배치될 수 있다.

[0060] 이와 같은 높이조절유닛(10)은 한 쌍의 크로스암(20)이 각각 대응하는 높이조절용 잠금장치(60)에 의해 개별적으로 동작되는 구조를 갖기 때문에, 한 쪽 크로스암(20)의 회전만 허용된 상태에서 상판(1)의 높이 가변을 제한하고, 한 쌍의 높이조절용 손잡이부(91)를 양손으로 동시에 조작하여 한 쌍의 크로스암(20)의 회전이 함께 허용된 상태에서만 상판(1)의 높이가 가변 될 수 있도록 한다. 따라서 본 실시 예에 따르면, 상판(1)의 승강 동작시 이용자의 손이 상부지지대(2)과 하부지지대(3) 사이에 끼게 되는 것을 거의 완벽하게 방지할 수 있게 되므로, 상판(1)의 승강에 따른 안전성을 충분히 확보할 수 있게 된다.

[0061] 또한 스탠딩 테이블은 상판(1)의 경사를 가변시키도록 마련된 경사조절유닛(100)을 더 구비하도록 마련될 수 있다.

[0062] 이를 위해 먼저 상판(1)은 전방 하면이 경첩부재(110)를 통해 상부지지대(2) 전방에 회전 가능하게 결합될 수 있다. 따라서 상판(1)은 전방이 상부지지대(2)에 힌지 결합된 상태에서 상부지지대(2) 상부에 회전 가능한 상태로 지지될 수 있게 된다.

[0063] 그리고 도 8내지 도 11에 도시된 바와 같이, 경사조절유닛(100)은 상판(1)의 경사를 높이는 방향으로 탄성지지하도록 상판(1) 저부에 위치하는 걸쇠(120)와, 걸쇠가 단계적으로 걸릴 수 있도록 마련된 복수의 제1걸이홈(130a,130b,130c)을 구비하도록 상판(1) 배면에 고정된 걸림판(130)과, 복수의 제1걸이홈(130a,130b,130c)과 같은 간격으로 나란히 배치된 복수의 제2걸이홈(140a)을 구비하여 제2걸이홈(140a)들이 제1걸이홈(130a,130b,130c)들과 일치된 상태로 정렬이 가능하도록 걸림판(130)에 슬라이딩 가능하게 장착된 슬라이딩부재(140)와, 슬라이딩부재(140)를 걸쇠(120)의 탄성지지방향의 반대방향으로 가압하여 슬라이딩 시키도록 마련된 가압수단(150)을 포함하도록 구성될 수 있다. 여기서 제1 및 제2걸이홈이 일치된 상태로 정렬된다는 것은 제1 및 제2걸이홈에 걸쇠(120)가 함께 걸릴 수 있도록 된다는 것을 의미한다.

[0064] 걸쇠(120)는 실질적으로 걸이홈에 걸리도록 수평으로 마련된 걸이봉(121)과, 걸이봉(121) 양단에 수직으로 연장된 한 쌍의 지지봉(122)을 구비하는 'ㄷ'자 모양으로 마련될 수 있다. 걸쇠(120)의 설치를 위해 상부지지대(2) 내측으로는 고정브래킷(129)이 설치될 수 있으며, 걸쇠(120)는 양 지지봉(122) 끝단에 측방으로 연장된 끼움돌기(122a)가 고정브래킷(129)에 회전 가능하게 결합된 상태로 고정브래킷(129)에 고정될 수 있다. 걸쇠(120)가 상판(1)의 경사를 높이는 방향으로 탄성지지 되도록 적어도 한 쪽의 끼움돌기(122a)에는 제3탄성부재(미도시)가 설치될 수 있으며, 제3탄성부재(미도시)는 중앙이 끼움돌기(122a)에 끼워진 상태에서 일단은 고정브래킷(129)에 고정되고 타단이 걸쇠(120)의 지지봉(122)에 고정된 토션스프링으로 마련될 수 있다.

[0065] 걸림판(130)은 나사 등의 체결부재를 통해 상판(1)의 배면에 체결되는 상판부(131)와, 상판부(131) 양측에 평행하게 수직으로 연장된 한 쌍의 측판부(132)를 포함할 수 있다. 측판부(132)는 상판(1)의 전후방으로 다소 길게 연장될 수 있으며, 상기 제1걸이홈(130a,130b,130c)은 각 측판부(132)에 측판부(132)의 길이방향을 따라 일정간격 이격되도록 형성될 수 있다. 본 실시 예의 경우 제1걸이홈(130a,130b,130c)은 각 측판부(132)에 3개씩 형성된다. 제1걸이홈(130a,130b,130c)은 슬라이딩부재(140)의 슬라이딩방향을 따라 양쪽의 제1(130a) 및 제3군(130c)과, 제1 및 제3군(130a,130c) 사이에 위치하는 제2군(130b)으로 구분될 수 있다.

[0066] 그리고 슬라이딩부재(140)는 한 쌍의 측판부(132) 사이에 측판부(132)와 나란하게 배치되는 한 쌍의 슬라이딩판(141)을 구비하도록 마련될 수 있다. 한 쌍의 슬라이딩판(141)은 상호 연결된 상태에서 걸림판(130)의 상판부(131)에 걸림판(130)의 길이방향으로 슬라이딩 가능하게 체결될 수 있다.

[0067] 각 슬라이딩판(141)에는 복수의 제2걸이홈(140a)이 제1걸이홈(130a,130b,130c) 사이의 간격과 같은 간격으로 형성될 수 있다. 제2걸이홈(140a)은 슬라이딩판(141)마다 2개씩 마련될 수 있다. 본 실시 예의 경우 걸쇠(120)의 걸이봉(121)이 안정적으로 걸릴 수 있도록 제1걸이홈(130a,130b,130c)이 마련된 걸림판(130)의 측판부(132)와,

제2걸이홈(140a)이 형성된 슬라이딩부재(140)의 슬라이딩판(1410)을 한 쌍씩 마련하였으나, 측판부(132)와 슬라이딩판(141)은 각각 하나씩으로도 구성이 가능하다.

[0068] 그리고 가압수단(150)은 경사조절용 잠금레버(160)와, 경사조절용 잠금레버(160)를 조작함에 따라 슬라이딩부재(140)를 걸쇠(120)의 탄성지지방향과 반대방향으로 밀도록 마련된 링크부재(170)를 포함하도록 구성될 수 있다.

[0069] 경사조절용 잠금레버(160)는 걸림판(130)의 길이방향과 수직으로 교차되는 방향으로 측판부(132)에 회전 가능하게 결합된 작동부(161)와, 작동부(161) 일단으로부터 절곡연장된 연결부(162)와, 연결부(162) 일단에 다시 절곡연장되어 작동부(161)와 평행하게 마련된 경사조절용 손잡이부(163)를 포함할 수 있다. 이러한 경사조절용 잠금레버(160)는 제4탄성부재(미도시)를 통해 경사조절용 손잡이부(163)가 상판(1) 저부로 탄력지지 되도록 걸림판(130)에 설치될 수 있다. 제4탄성부재(미도시)는 일단은 작동부(161)에 지지되고 타단은 걸림판(130)에 지지되는 토션스프링으로 마련될 수 있다.

[0070] 그리고 링크부재(170)는 일단이 작동부(161)에 고정되어 작동부(161)의 회전시 회동하도록 마련된 제1링크(171)와, 중도가 절곡된 상태로 한 쌍의 슬라이딩판(141) 사이에 고정되어 제1링크(171)와 대응하는 단부가 제1링크(171)에 회전 가능하게 결합된 제2링크(172)를 포함하도록 구성될 수 있다. 제2링크(172)는 양측으로 연장된 고정돌기(172a)가 슬라이딩판(141)에 체결됨에 따라 슬라이딩판(141)에 고정된 상태로 제1링크(171)에 밀려 슬라이딩판(141)을 전진방향으로 슬라이딩시킬 수 있게 된다.

[0071] 경사조절유닛(100)을 이용한 상판(1)의 경사조절동작을 설명하면 다음과 같다.

[0072] 도 9에는 걸쇠(120)의 걸이봉(121)이 상호 일치된 제1걸이홈(130a,130b,130c)의 제2군(130b)과 제2걸이홈(140a)에 걸린 상태의 구조가 도시된다.

[0073] 이 상태에서 상판(1)의 경사를 더욱 높이고자 할 경우, 이용자는 도 10에 도시된 바와 같이, 경사조절용 잠금레버(160)의 경사조절용 손잡이부(163)를 상판(1) 배면 쪽으로 들어올리게 된다.

[0074] 이에 따라 제1링크(171)의 회전동작에 의해 제1 및 제2링크(171,172) 사이가 벌어지게 되면서 슬라이딩부재(140)는 제2링크(172)와 함께 화살표 방향으로 전진하게 된다. 따라서 이 상태에서는 나란하게 되어 있던 제1 및 제2걸이홈(130b,140a) 사이가 어긋난 위치가 되면서 제1 및 제2걸이홈에 걸려 있던 걸이봉(121)이 제1 및 제2걸이홈(130b,140a)으로부터 빠져 나오게 된다.

[0075] 이 상태에서 이용자는 상판(1)의 후방을 상부로 들어올리거나 하부로 내려 상판(1)의 경사를 변화시키게 되는데, 이때 상판(1)이 경사가 높아지도록 전방으로 세워질 경우 걸쇠(120)는 제3탄성부재(미도시)를 통해 세워지는 방향으로 이동하게 되고, 상판(1)이 경사가 낮아지도록 눕혀질 경우 걸쇠(120) 역시 걸림판(130)에 의해 눌려져 눕혀지게 된다.

[0076] 이후 경사조절용 잠금레버(160)의 경사조절용 손잡이부(163)에 가해졌던 힘을 제거하게 되면, 도 11에 도시된 바와 같이, 제4탄성부재(미도시)의 복원력을 통해 슬라이딩부재(140)가 후진하게 되면서 제2걸이홈(140a)은 보조판(3)의 경사변화에 따라 제1걸이홈(130a,130b,130c) 중 1군(130a) 또는 3군(130c)과 일치된 상태로 정렬될 수 있게 되고, 걸이봉(121)은 다시 일치된 제1 및 제2걸이홈에 걸려 지지되면서 조절된 상판(1)의 경사가 유지되도록 한다.

[0077] 도 11의 경우, 걸이봉(121)이 제1걸이홈(130a,130b,130c) 중 제1군(130a)과 일치된 제2걸이홈(140a)에 걸려 지지됨으로써, 도 9에 대해 상판(1)이 더 큰 경사를 갖도록 조절된 상태를 나타낸 것이다.

[0078] 그리고 상기 경사조절용 손잡이부(163)는 상판(1)의 외곽 안쪽에 위치하게 되며, 경사조절용 손잡이부(163)의 위치에 대응하는 부위의 상판(1)에는 경사조절용 손잡이부(163)를 상판(3) 상부로부터 손을 넣어 잡을 수 있도록 조작구멍(1a)이 관통되게 마련될 수 있다.

[0079] 따라서 경사조절유닛(100)을 이용하여 상판(1)의 경사를 가변시키고자 할 경우, 이용자는 자신의 한 쪽 손을 상판(1) 상부로부터 조작구멍(1a)으로 삽입한 상태에서 경사조절용 손잡이부(163)를 파지하여 조작할 수 있게 된다. 이때 이용자는 경사조절용 손잡이부(163)를 파지한 손으로 상판(3)을 걸어 잡을 수 있게 되므로, 상판(1)을 손으로 잡은 상태에서 상판(1)의 경사를 안전하게 조절할 수 있게 된다.

[0080] 또 상판의 경사조절 동작이 진동이 없는 상태에서 안정적으로 이루어질 수 있도록 상판(1)과 고정브래킷(129) 사이에는 제2 쇼크업소버(shock absorber) (180)가 더 설치될 수 있다.

[0081] 제2 쇼크업소버(180)는 일단이 상판(1) 저면에 결합되고 타단이 고정브래킷(129) 일측에 결합되어 상판(1)의 경

사소절 동작에 따른 충격을 흡수하게 된다.

[0082] 이상에서는 특정의 실시 예에 대하여 도시하고 설명하였다. 그러나 본 고안은 상기한 실시 예에만 한정되지 않으며, 고안이 속하는 기술분야에서 통상의 지식을 가진 자라면 이하의 청구범위에 기재된 고안의 기술적 사상의 요지를 벗어남이 없이 얼마든지 다양하게 변경 실시할 수 있을 것이다.

부호의 설명

[0083]

1: 상판 1a: 조작구멍

2: 상부지지대 3: 하부지지대

10: 높이조절유닛 20: 크로스암

30: 제1링크암 40: 제2링크암

50: 제1쇼크업소버 60: 높이조절용 잠금장치

70: 제1결림부 72: 제1톱니

80: 제2결림부 85: 제2톱니

90: 높이조절용 잠금레버 91: 높이조절용 손잡이부

100: 경사조절유닛 120: 결쇠

130: 결림판 140: 슬라이딩부재

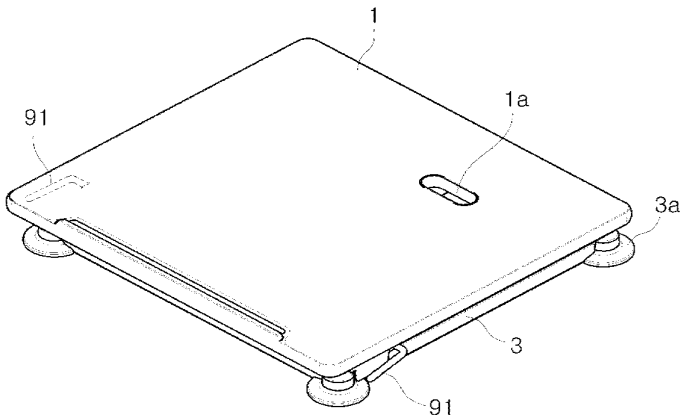
150: 가압수단 160: 경사조절용 잠금레버

163: 경사조절용 손잡이부 170: 링크부재

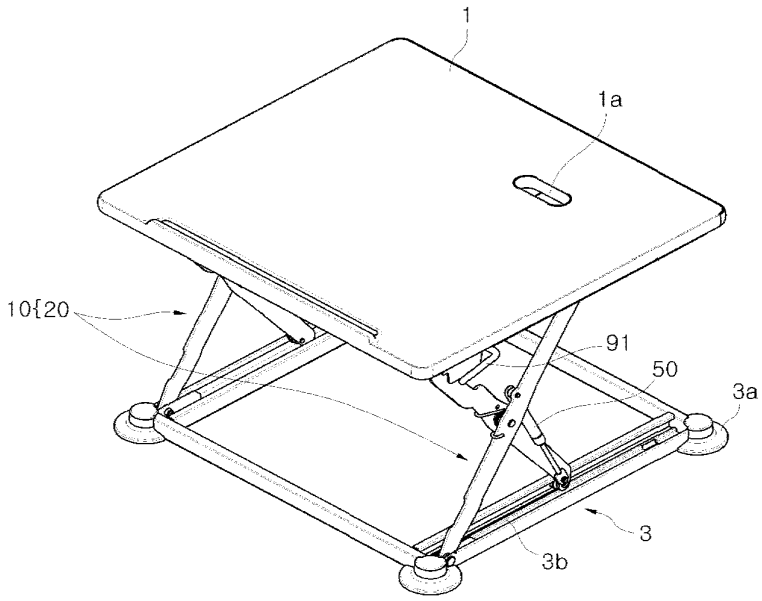
180: 제2쇼크업소버

도면

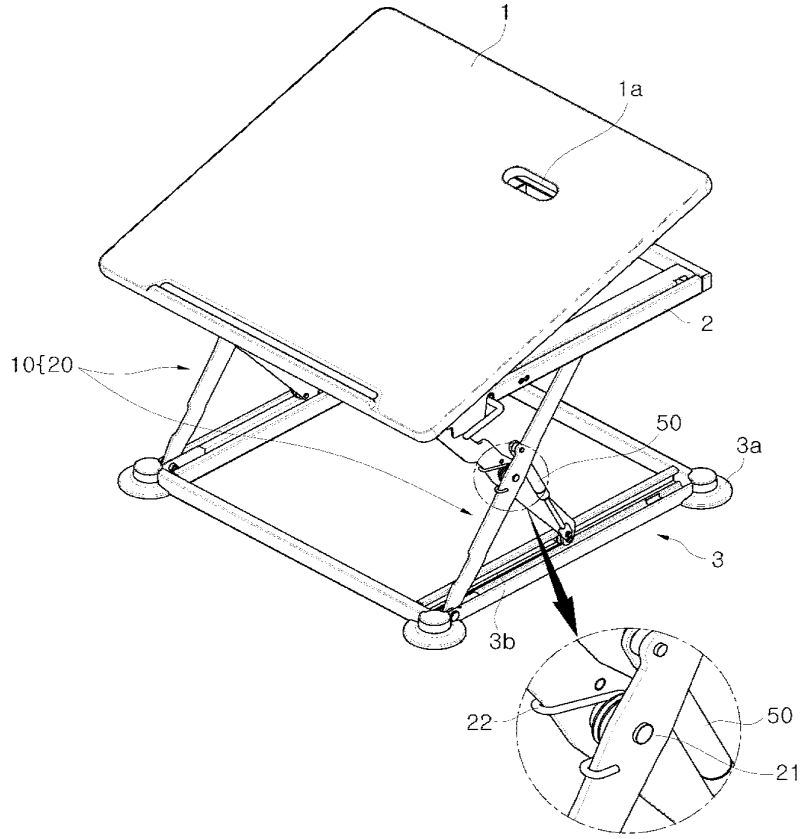
도면1



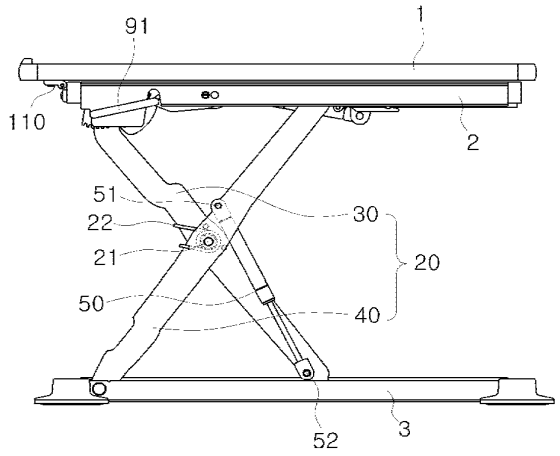
도면2



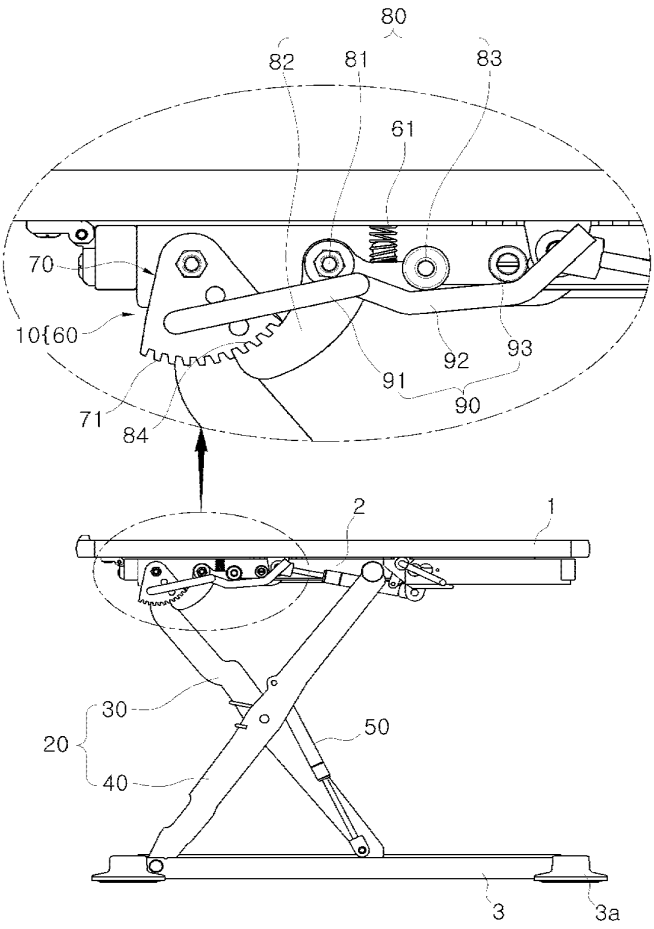
도면3



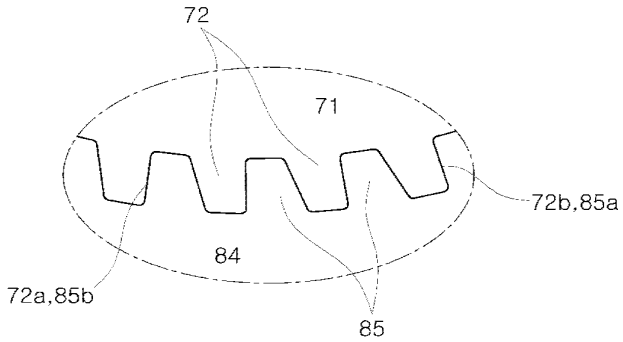
도면4



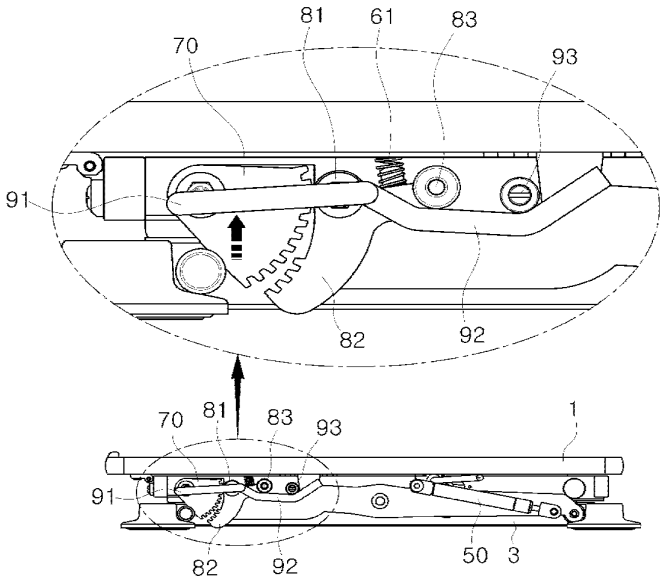
도면5


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3a

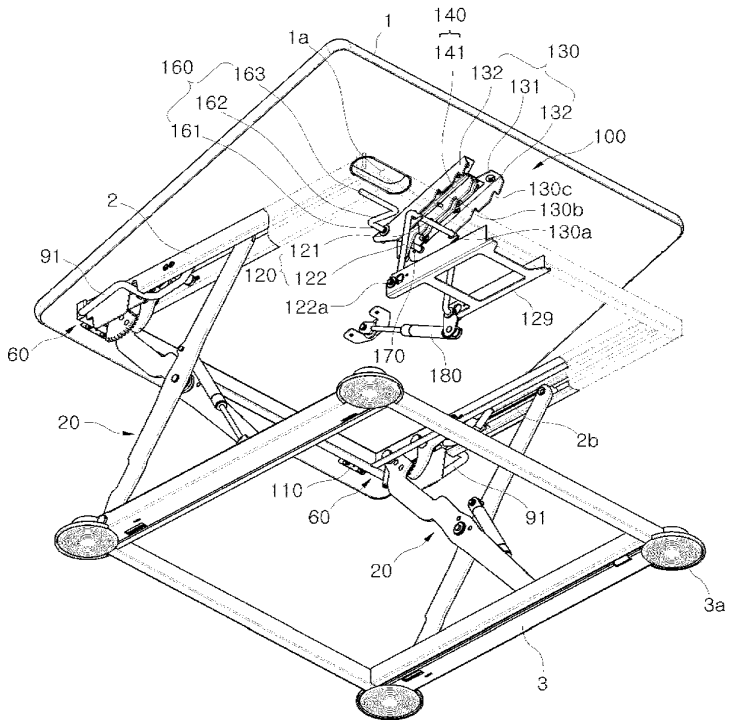
도면6


72
71
72b,85a
84
72a,85b
85

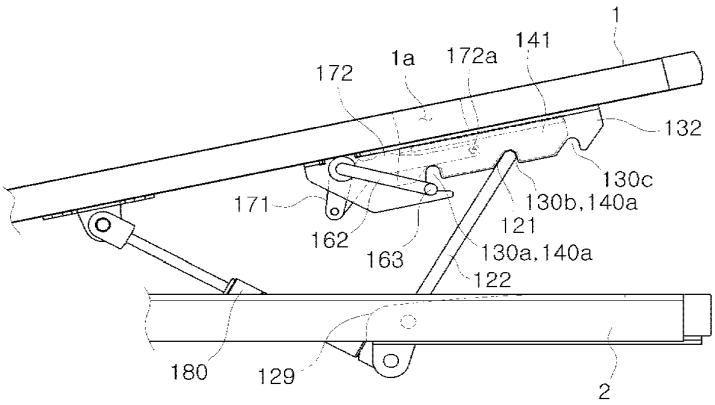
도면7


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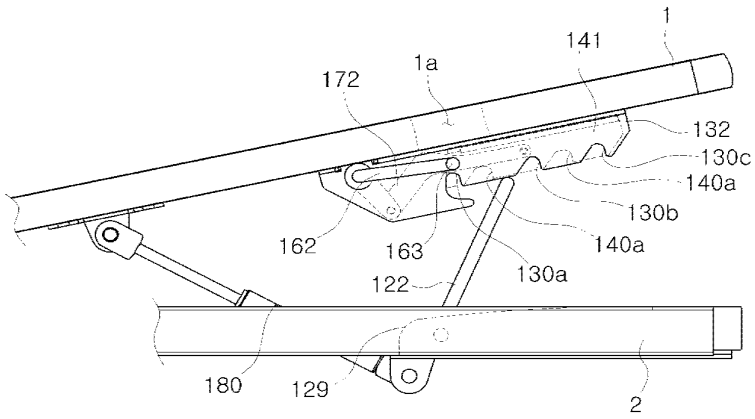
도면8


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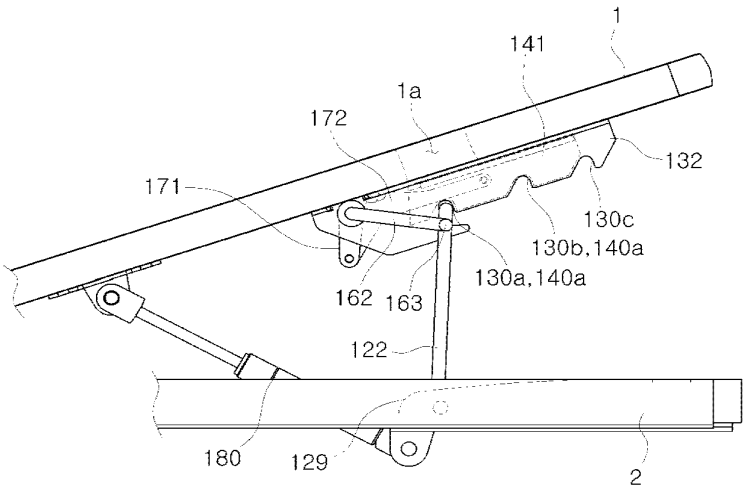
도면9



도면10



도면11



Doc Code: DIST.E.FILE Document Description: Electronic Terminal Disclaimer - Filed	PTO/SB/26 U.S. Patent and Trademark Office Department of Commerce

Electronic Petition Request	**TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT**
Application Number	17493830
Filing Date	04-Oct-2021
First Named Inventor	Nathan Poniatowski
Attorney Docket Number	1001-001US13
Title of Invention	DESKTOP WORKSPACE THAT ADJUSTS VERTICALLY

☒ Filing of terminal disclaimer does not obviate requirement for response under 37 CFR 1.111 to outstanding Office Action

☒ This electronic Terminal Disclaimer is not being used for a Joint Research Agreement.

Owner	Percent Interest
Office Kick, Inc.	100%

The owner(s) with percent interest listed above in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent number(s)

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as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the prior patent, "as the term of said prior patent is presently shortened by any terminal disclaimer," in the event that said prior patent later:
- expires for failure to pay a maintenance fee;
- is held unenforceable;
- is found invalid by a court of competent jurisdiction;
- is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
- has all claims canceled by a reexamination certificate;
- is reissued; or
- is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

◉ Terminal disclaimer fee under 37 CFR 1.20(d) is included with Electronic Terminal Disclaimer request.

○ I certify, in accordance with 37 CFR 1.4(d)(4), that the terminal disclaimer fee under 37 CFR 1.20(d) required for this terminal disclaimer has already been paid in the above-identified application.

Applicant claims the following fee status:

◉ Small Entity

○ Micro Entity

○ Regular Undiscounted

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES

I certify, in accordance with 37 CFR 1.4(d)(4) that I am:

◉ An attorney or agent registered to practice before the Patent and Trademark Office who is of record in this application

Registration Number 58614

○ A sole inventor

○ A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors as evidenced by the power of attorney in the application

○ A joint inventor; all of whom are signing this request

Signature	/Daniel Lund/
Name	Daniel T. Lund

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

Electronic Acknowledgement Receipt

EFS ID:	47293073
Application Number:	17493830
International Application Number:	
Confirmation Number:	4682
Title of Invention:	DESKTOP WORKSPACE THAT ADJUSTS VERTICALLY
First Named Inventor/Applicant Name:	Nathan Mark Poniatowski
Customer Number:	155431
Filer:	Daniel Thomas Lund
Filer Authorized By:	
Attorney Docket Number:	1001-001US13
Receipt Date:	29-DEC-2022
Filing Date:	04-OCT-2021
Time Stamp:	14:39:57
Application Type:	Utility under 35 USC 111(a)

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Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$170
RAM confirmation Number	E2022BSE39531038
Deposit Account	602335
Authorized User	Daniel Lund

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Terminal Disclaimer-Filed (Electronic)	eTerminal-Disclaimer.pdf	41741 fc78de34da10f86b3257f8f18357d4fd8ac4d8e6	no	2
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	37779 34db67b1fca4da674d0d4e066c5e52c587366e8d	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	79520		

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

(19)中华人民共和国国家知识产权局

(12)发明专利申请

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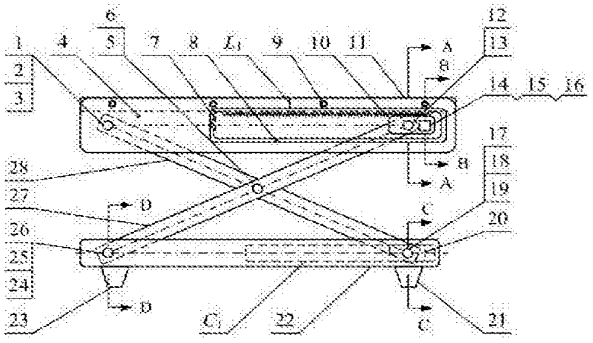
权利要求书2页 说明书5页 附图9页

(54)发明名称

图书馆读者自主升降书桌

(57)摘要

本发明公布一种图书馆读者自主升降书桌，属于家具领域。包括桌面和安装在桌面两侧的彼此相对称的右X型支撑和左X型支撑；右X型支撑和左X型支撑上端一侧与桌面之间分别设有高度调节机构。读者可以根据自己的需要调节桌面的高度，若桌面下面左右斜齿条的节距为*P*，沿着斜齿条中线方向前后两个支点之间的距离改变一个节距，桌面高度在最大值与最小值之间升降时，桌面高度的平均变化量对一个节距变化量的响应为0.885*P*，这样的调节精度完全满足使用者的需求，桌面左右侧各有自主调节桌面高度的按钮，只要按动按钮即可进行自我调节桌面高度，只要松开按钮桌面的高度就确定了。



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1.一种图书馆读者自主升降书桌，其特征在于：包括桌面(11)和安装在桌面(11)两侧的彼此相对称的右X型支撑和左X型支撑；

所述右X型支撑包括固定在桌面(11)下的右上梁(4)，和位于右上梁(4)下方与右上梁(4)平行的右下梁(22)；所述右上梁(4)与右下梁(22)之间连接有中部铰接在一起呈X型的右第一支杆(27)和右第二支杆(28)；所述右第二支杆(28)上端铰接在右上梁(4)后端，右第二支杆(28)下端铰接有右下滑块(20)；所述右下梁(22)前端开有一段右下梁导槽(C_1)，所述右下滑块(20)滑动安装在右下梁导槽(C_1)内；所述右第一支杆(27)下端铰接在右下梁(22)后端，右第一支杆(27)上端铰接有右齿条滑块(10)；所述右上梁(4)前端开有一段右上梁导槽(C_5)，所述右齿条滑块(10)位于右上梁导槽(C_5)内，在右齿条滑块(10)与右上梁导槽(C_5)之间安装有高度调节机构；

所述高度调节机构包括固定在右上梁(4)中右上梁导槽(C_5)内的右齿条框架(8)，右齿条框架(8)上边框下侧固定有齿条，所述右齿条滑块(10)上端面固定有一排与右齿条框架(8)齿条相配合的齿；右齿条滑块(10)外侧端面开有一个右按扭导槽(C_4)，右按扭导槽(C_4)内由内之外依次设有右复位弹簧(15)和右按扭(16)，右复位弹簧(15)两端分别连接在右按扭导槽(C_4)底部和右按扭(16)内端面上；所述右按扭导槽(C_4)上侧开有一条连通至右齿条滑块(10)上端面的右推杆导槽(C_3)，在所述右按扭(16)上铰接有右推杆(14)，右推杆(14)上端穿过右推杆导槽(C_3)后抵在右上梁导槽(C_5)上。

2.根据权利要求1所述的图书馆读者自主升降书桌，其特征在于：所述右齿条框架(8)上方预定位置设有一条桌面右标高刻线(L_1)；所述右齿条滑块(10)外侧面固定有一个右标定杆(54)。

3.根据权利要求1所述的图书馆读者自主升降书桌，其特征在于：所述右下梁(22)两端固定有右前橡胶垫块(21)和右后橡胶垫块(23)；所述右前橡胶垫块(21)和右后橡胶垫块(23)通过强力胶与右下梁(22)粘接。

4.根据权利要求1所述的图书馆读者自主升降书桌，其特征在于：所述右第二支杆(28)上端连接有右后上销轴(1)；所述右后上销轴(1)上可转动套有一个右后套(2)；右后套(2)采用聚四氟乙烯材料，右后套(2)与右上梁(4)后端过盈连接；在所述右后上销轴(1)上还设有用于将右第二支杆(28)与右后套(2)定位在右后上销轴(1)上的右后上挡圈(3)；

右第二支杆(28)下端与右下滑块(20)之间通过一个右前下销轴(17)可转动连接，在右前下销轴(17)上套有一个位于右第二支杆(28)和右下滑块(20)之间的右前下套(18)；右前下销轴(17)端部设有用于将右第二支杆(28)定位在右前下销轴(17)上的右前下挡圈(19)。

5.根据权利要求2所述的图书馆读者自主升降书桌，其特征在于：所述右第一支杆(27)下端连接有右后下销轴(24)；所述右后下销轴(24)上可转动套有一个右后下套(25)，右后下套(25)与右下梁(22)后端过盈连接；在所述右后下销轴(24)上还设有用于将右后下套(25)与右第一支杆(27)定位在右后下销轴(24)上的右后下挡圈(26)；

右第一支杆(27)上端与右齿条滑块(10)之间通过一个右前上销轴(12)可转动连接，在右前上销轴(12)端部设有用于将右第一支杆(27)和右齿条滑块(10)定位在右前上销轴(12)上的右前上挡圈(13)。

6.根据权利要求5所述的图书馆读者自主升降书桌，其特征在于：所述右标定杆(54)安装在右前上销轴(12)外端；右标定杆(54)与右齿条滑块(10)之间设有右定位销(55)；右标

定杆(54)上端设有指针，当所述右标定杆(54)上的指针对准桌面(11)上的右标高刻线(L_1)时，桌面(11)的高度为设计的基准高度。

7.根据权利要求1所述的图书馆读者自主升降书桌，其特征在于：所述右齿条框架(8)固定在右上梁(4)中右上梁导槽(C_5)内外端位置，右齿条框架(8)内壁与右上梁导槽(C_5)内表面平齐；右齿条框架(8)内壁前后两端通过右横向木螺钉(7)与右上梁导槽(C_5)前后两端连接。

图书馆读者自主升降书桌

技术领域

[0001] 本发明涉及家具领域，具体是一种图书馆读者自主升降书桌。

背景技术

[0002] 图书馆是学子的天堂，不论高与矮、男生与女生挤满图书馆的学习区，自习桌常常座无虚席，馆员巡视发现，现在的自习桌是同一高度，这是基于制造的相对简单性与使用场合的整体美感的需要，学生可不是相同的身高，这是基因与自然选择的现象，于是，相对于自习桌较高的学生长时间在弯腰看书与写字，相对于自习桌较矮的学生长时间抬高自己的双臂在看书与写字，这是用同一把尺子度量所有人的必然结果，这一方面不利于所有的学生都能长时间舒心地学习，另一方面也会对学生的骨骼产生不良地影响，同时也不利于培养学生的创新意识。

发明内容

[0003] 为解决上述技术问题，本发明提供一种图书馆读者自主升降书桌，读者可以根据自己的需要调节桌面的高度。

[0004] 本发明是通过如下技术方案实现的：一种图书馆读者自主升降书桌，包括桌面和安装在桌面两侧的彼此相对称的右X型支撑和左X型支撑；所述右X型支撑包括固定在桌面下的右上梁，和位于右上梁下方与右上梁平行的右下梁；所述右上梁与右下梁之间连接有中部铰接在一起呈X型的右第一支杆和右第二支杆；所述右第二支杆上端铰接在右上梁后端，右第二支杆下端铰接有右下滑块；所述右下梁前端开有一段右下梁导槽，所述右下滑块滑动安装在右下梁导槽内；所述右第一支杆下端铰接在右下梁后端，右第一支杆上端铰接有右齿条滑块；所述右上梁前端开有一段右上梁导槽，所述右齿条滑块位于右上梁导槽内，在右齿条滑块与右上梁导槽之间安装有高度调节机构；所述高度调节机构包括固定在右上梁中右上梁导槽内的右齿条框架，右齿条框架上边框下侧固定有齿条，所述右齿条滑块上端面固定有一排与右齿条框架齿条相配合的齿；右齿条滑块外侧端面开有一个右按扭导槽，右按扭导槽内由内之外依次设有右复位弹簧和右按扭，右复位弹簧两端分别连接在右按扭导槽底部和右按扭内端面上；所述右按扭导槽上侧开有一条连通至右齿条滑块上端面的右推杆导槽，在所述右按扭上铰接有右推杆，右推杆上端穿过右推杆导槽后抵在右上梁导槽上。

[0005] 其进一步是：所述右齿条框架上方预定位置设有一条桌面右标高刻线；所述右齿条滑块外侧面固定有一个右标定杆。

[0006] 所述右下梁两端固定有右前橡胶垫块和右后橡胶垫块；所述右前橡胶垫块和右后橡胶垫块通过强力胶与右下梁粘接。

[0007] 所述右第二支杆上端连接有右后上销轴；所述右后上销轴上可转动套有一个右后套；右后套采用聚四氟乙烯材料，右后套与右上梁后端过盈连接；在所述右后上销轴上还设有用于将右第二支杆与右后套定位在右后上销轴上的右后上挡圈；

右第二支杆下端与右下滑块之间通过一个右前下销轴可转动连接，在右前下销轴上套有一个位于右第二支杆和右下滑块之间的右前下套；右前下销轴端部设有用于将右第二支杆定位在右前下销轴上的右前下挡圈。

[0008] 所述右第一支杆下端连接有右后下销轴；所述右后下销轴上可转动套有一个右后下套，右后下套与右下梁后端过盈连接；在所述右后下销轴上还设有用于将右后下套与右第一支杆定位在右后下销轴上的右后下挡圈；右第一支杆上端与右齿条滑块之间通过一个右前上销轴可转动连接，在右前上销轴端部设有用于将右第一支杆和右齿条滑块定位在右前上销轴上的右前上挡圈。

[0009] 所述右标定杆安装在右前上销轴外端；右标定杆与右齿条滑块之间设有右定位销；右标定杆上端设有指针，当所述右标定杆上的指针对准桌面上的右标高刻线时，桌面的高度为设计的基准高度。

[0010] 所述右齿条框架固定在右上梁中右上梁导槽内外端位置，右齿条框架内壁与右上梁导槽内表面平齐；右齿条框架内壁前后两端通过右横向木螺钉与右上梁导槽前后两端连接。

[0011] 本发明可以根据自己的需要调节桌面的高度，若桌面下面左右两侧斜齿条的节距为P，沿着斜齿条中线方向前后两个支点之间的距离改变一个节距，桌面高度在最大值与最小值之间升降时，桌面高度的平均变化量对一个节距变化量的响应为$0.885P$，这样的调节精度完全满足使用者的需求；本发明解决了不同高度的读者使用同一高度自习桌子带来的不适问题，满足读者的心理需求，也将对读者个性化的服务落实到了实处，同时也为读者采用机构学的方法解决现实世界中的实际问题提供了案例引导。

附图说明

[0012] 图1是本发明桌面降到最低位置的主视图；

图2是本发明桌面升到任意位置的主视图；

图3是本发明桌面降到最低位置的后视图；

图4是本发明桌面升到任意位置的后视图；

图5是本发明桌面升到任意位置的左视图；

图6是图1中右前上销轴连接处A-A截面图；

图7是图1中右前上销轴连接处桌面高度非调节状态的B-B截面图；

图8是图1中右前上销轴连接处桌面高度调节状态的B-B截面图；

图9是右齿条滑块的主视图；

图10是右齿条滑块的左视图；

图11是图9中G-G截面图；

图12是右齿条滑块的俯视图；

图13是图1中右前下销轴连接处C-C截面图；

图14是图1中右后下销轴连接处D-D截面图；

图15是图3中左前上销轴连接处E-E截面图；

图16是图3中左推杆连接处桌面高度非调节状态的F-F截面图；

图17是图3中左推杆连接处桌面高度调节状态的F-F截面图。

[0013] 图中：1 右后上销轴；2 右后套；3 右后上挡圈；4 右上梁；5 中间销轴；6 中间挡圈；7 右横向木螺钉；8 右齿条框架；9 右纵向木螺钉；10 右齿条滑块；11 桌面；12 右前上销轴；13 右前上挡圈；14 右推杆；15 右复位弹簧；16 右按扭；17 右前下销轴；18 右前下套；19 右前下挡圈；20 右下滑块；21 右前橡胶垫块；22 右下梁；23 右后橡胶垫块；24 右后下销轴；25 右后下套；26 右后下挡圈；27 右第一支杆；28 右第二支杆；54 右标定杆；55 右定位销；56 右推杆销轴；

29 左后上销轴；30 左后套；31 左后上挡圈；32 左上梁；33 左横向木螺钉；34 左齿条框架；35 左纵向木螺钉；36 左齿条滑块；37 左前上销轴；38 左前上挡圈；39 左推杆；40 左复位弹簧；41 左按扭；42 左前下销轴；43 左前下套；44 左前下挡圈；45 左下滑块；46 左前橡胶垫块；47 左下梁；48 左后橡胶垫块；49 左后下销轴；50 左后下套；51 左后下挡圈；52 左第一支杆；53 左第二支杆；57 左标定杆；58 左定位销；59 左推杆销轴。

[0014] 图中符号：L_1 桌面右标高刻线；L_2 桌面左标高刻线；C_1 右下梁导槽；C_2 左下梁导槽；C_3 右推杆导槽；C_4 右按扭导槽；C_5 右上梁导槽；C_6 左推杆导槽；C_7 左按扭导槽；C_8 左上梁导槽；H 桌面高度；H_1 底架高；H_2 X型高；H_3 顶架高；L_z 支杆两支点之间的长度。

具体实施方式

[0015] 以下是本发明的一个具体实施例，现结合附图对本发明做进一步说明。

[0016] 如图1至图5所示，一种图书馆读者自主升降书桌，包括桌面11和安装在桌面11两侧的彼此相对称的右X型支撑和左X型支撑；右X型支撑和左X型支撑结构相同，工作原理和操作过程一致，现仅对右X型支撑做详尽描述。

[0017] 右X型支撑：

右上梁4为实木梁，右上梁4前端开有一段右上梁导槽C_5；右下梁22位于右上梁4下方并与右上梁4平行，右下梁22前端开有一段右下梁导槽C_1。右第一支杆27和右第二支杆28中部铰接在一起，呈X型，右第一支杆27和右第二支杆28连接在右上梁4和右下梁22之间。右下梁22两端固定有右前橡胶垫块21和右后橡胶垫块23；右前橡胶垫块21和右后橡胶垫块23通过强力胶与右下梁22粘接；

右第二支杆28上端连接有右后上销轴1，右后上销轴1上可转动套有一个右后套2，右后上销轴1与右后套2组成转动副；右后套2采用聚四氟乙烯材料，右后套2与右上梁4后端的孔过盈连接；右后上销轴1上还设有用于将右第二支杆28与右后套2定位在右后上销轴1上的右后上挡圈3。再结合图13所示，右第二支杆28下端与右下滑块20安装在右前下销轴17上并组成转动副，在右前下销轴17上套有一个位于右第二支杆28和右下滑块20之间的右前下套18，右前下套18用于轴向定位右下滑块20与右第二支杆28；右前下销轴17端部设有用于将右第二支杆28定位在右前下销轴17上的右前下挡圈19；右下滑块20滑动安装在右下梁导槽C_1内；

再如图14所示，右第一支杆27下端连接有右后下销轴24，右后下销轴24上可转动套有一个右后下套25，右后下套25与右下梁22后端的孔过盈连接；右后下套25通过右后下销轴24与右下梁22组成转动副，右后下挡圈26将右后下套25与右第一支杆27与定位在右后下销轴24上。再结合图6所示，右第一支杆27上端与右齿条滑块10之间通过一个右前上销轴12可转动连接，右齿条滑块10通过右前上销轴12与右第一支杆27组成转动副，右前上挡圈13将

右第一支杆27和右齿条滑块10定位在右前上销轴12上；右齿条滑块10位于右上梁导槽C_5内，在右齿条滑块10与右上梁导槽C_5之间安装有高度调节机构。

[0018] 高度调节机构：

再结合图7、图8所示，右齿条框架8固定在右上梁4中右上梁导槽C_5内靠外位置，右齿条框架8内壁与右上梁导槽C_5内表面平齐，右齿条框架8上边框下侧固定有齿条；右齿条框架8内壁前后两端通过右横向木螺钉7与右上梁导槽C_5前后两端固定连接。右齿条滑块10在右上梁导槽C_5和右齿条框架8内前后移动，右齿条滑块10上端面靠外侧位置设有一排与右齿条框架8齿条相配合的齿；在重力作用下，右齿条框架8下的齿条与右齿条滑块10的齿接触、啮合，保持桌子的稳定。再结合图9至图12所示，在右齿条滑块10外侧端面开有一个右按扭导槽C_4，右按扭导槽C_4内由内之外依次设有右复位弹簧15和右按扭16，右复位弹簧15两端分别连接在右按扭导槽C_4底部和右按扭16内端面上；右按扭导槽C_4上侧开有一条连通至右齿条滑块10上端面的右推杆导槽C_3，在右按扭16上通过右推杆销轴56铰接有右推杆14；在右推杆导槽C_3内端有一块凸起，右推杆14上端向内侧倾斜，右推杆14上端穿过右推杆导槽C_3后抵在右上梁导槽C_5与凸起上。

[0019] 右齿条框架8上方右上梁4上的预定位置设有一条桌面右标高刻线L_1；右齿条滑块10外侧面设有右标定杆54，右标定杆54安装在右前上销轴12上，右定位销55将右标定杆54定位在右齿条滑块10上；右标定杆54上端设有指针，当右标定杆54上的指针对准桌面11上的右标高刻线L_1时，桌面11的高度为设计的基准高度。

[0020] 结合图1至图5，以及图15至图17所示，左X型支撑和右X型支撑的结构相同，其具体包括：左后上销轴29，左后套30，左后上挡圈31，左上梁32，左横向木螺钉33，左齿条框架34，左纵向木螺钉35，左齿条滑块36，桌面11，左前上销轴37，左前上挡圈38，左推杆39，左复位弹簧40，左按扭41，左前下销轴42，左前下套43，左前下挡圈44，左下滑块45，左前橡胶垫块46，左下梁47，左后橡胶垫块48，左后下销轴49，左后下套50，左后下挡圈51，左第一支杆52，左第二支杆53，左标定杆57，左定位销58，左推杆销轴59；桌面左标高刻线L_2 ，左下梁导槽C_2 ，C_6 左推杆导槽；C_7 左按扭导槽，左上梁导槽C_8 。

[0021] 右上梁4和左上梁32上端内侧开口台阶状的安装槽，桌面11两侧配合放入右上梁4和左上梁32的安装槽内，右上梁4和左上梁32表面与桌面11表面平齐；右纵向木螺钉9将右上梁4与桌面11固定连接起来，左纵向木螺钉35将左上梁32与桌面11固定连接起来。右第一支杆27中间通过中间销轴5一端与右第二支杆28组成转动副，左第一支杆52中间通过中间销轴5另一端与左第二支杆53组成转动副，中间挡圈6将右第一支杆27中间通过中间销轴5一端与、右第二支杆28、左第一支杆52、左第二支杆53定位在中间销轴5上。

[0022] 使用方法：

当用手指向内按动右按扭16时，右推杆14的上端与右上梁4内的右上梁导槽C_5上面接触，右推杆14的中部与右齿条滑块10内的右推杆导槽C_3侧面接触，右推杆14下端与右齿条滑块10内的右按扭导槽C_4下面接触；右推杆14摆动使右齿条滑块10下移1.2倍的螺纹高度H_0，右齿条滑块10上面的齿与右齿条框架8上端的齿条分离；同时，针对左X型支撑的操作过程相同，此时，用双手向前移动桌面，桌面的高度降低，用双手向后移动桌面，桌面的高度升高，降低或升高到需要的高度后，双手离开右按扭16与左按扭41；这样，右X型支撑中的右齿条滑块10上的齿与右齿条框架8上的齿条再次接触，左X型支撑中的左齿条滑块36上的齿与

左齿条框架34上的齿条再次接触，桌面的高度得到保持，即可以进入学习状态了。

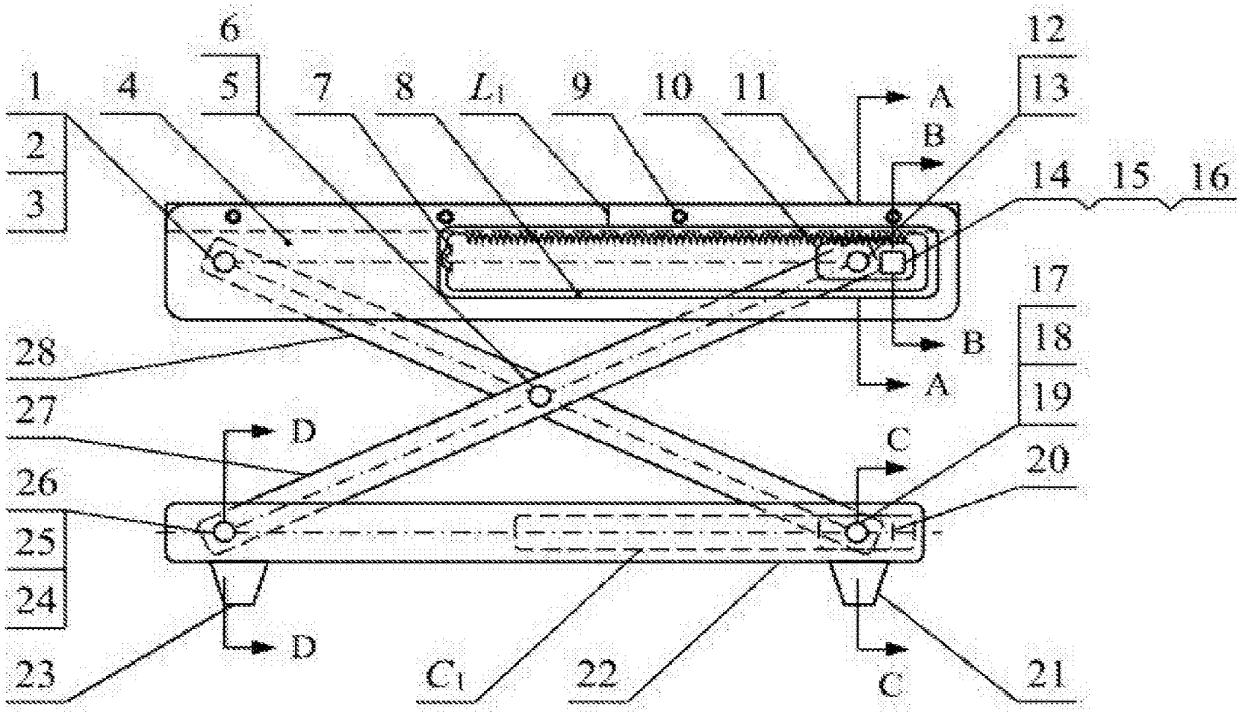

6
12
1
4
5
7
8
L_1
9
10
11
A
13
2
B
3
14
15
16
17
28
B
18
A
19
27
D
C
26
20
25
24
D
23
C_1
22
C
21

图1

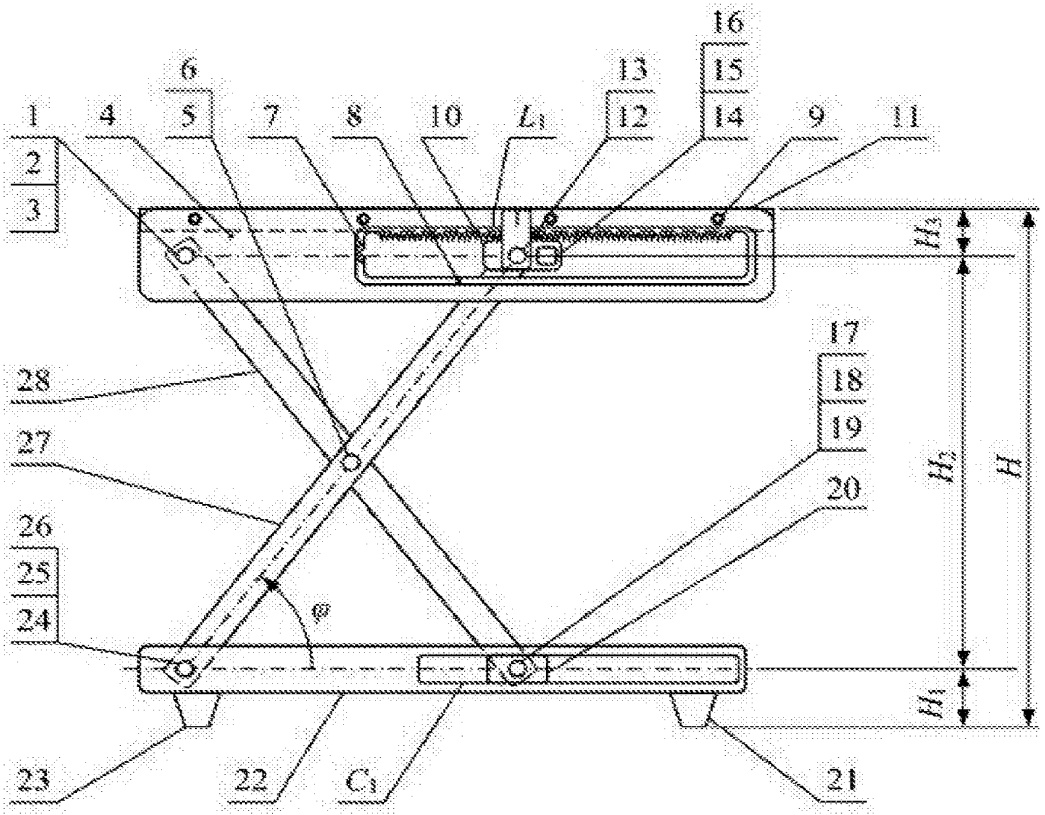

16
15
14
13
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6
5
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2
3
4
7
8
10
L_1
9
11
H_3
17
18
19
20
28
27
26
25
24
φ
H_2
H
H_1
23
22
C_1
21

图2

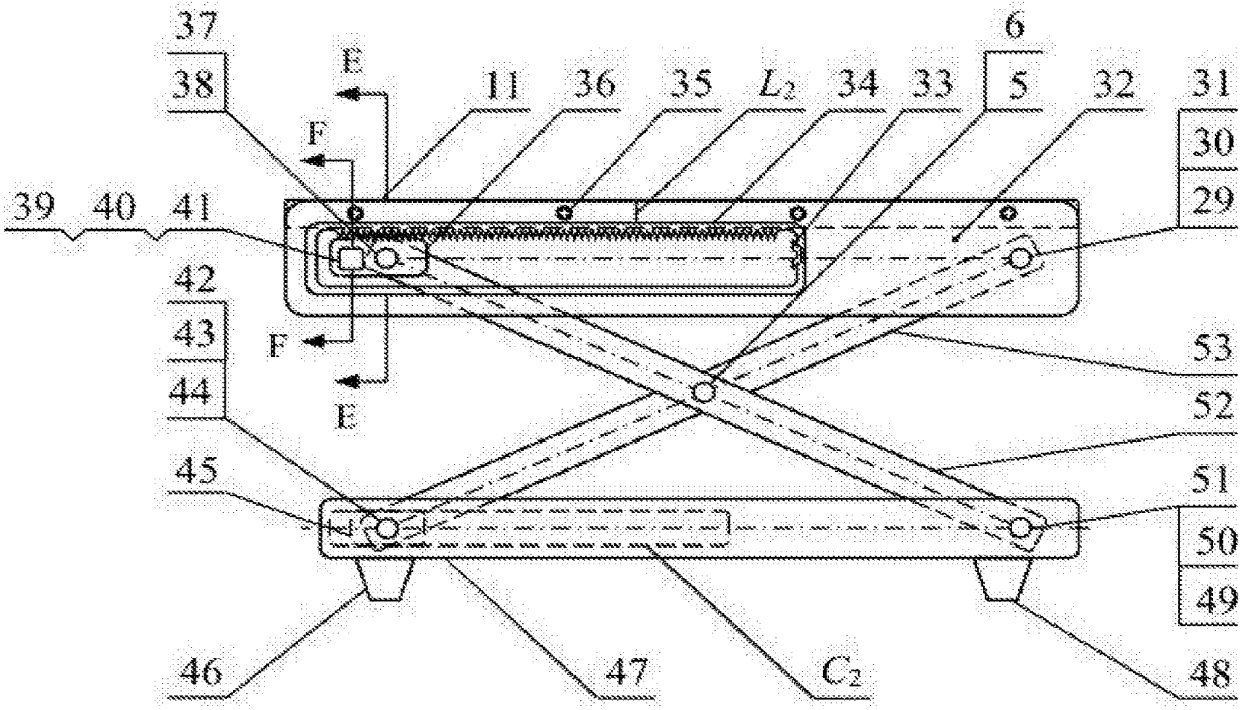

37
38
E
F
11
36
35
L_2
34
33
6
5
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29
39
40
41
42
43
44
F
E
53
52
45
51
50
49
46
47
C_2
48

图3

10

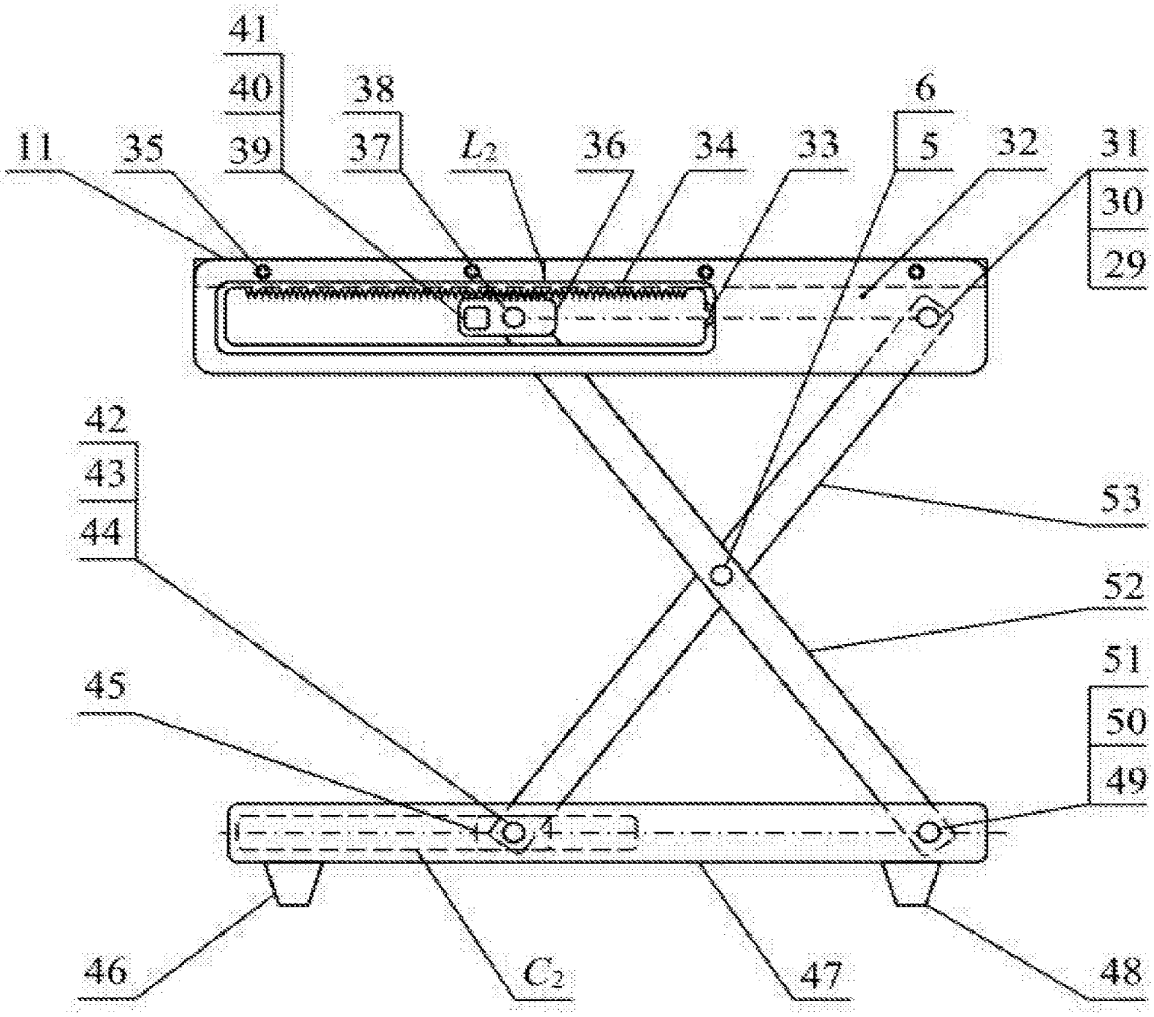

41
40
39
38
37
11
35
L_2
36
34
33
6
5
32
31
30
29
42
43
44
53
52
51
50
49
45
4
46
C_2
47
48

图4

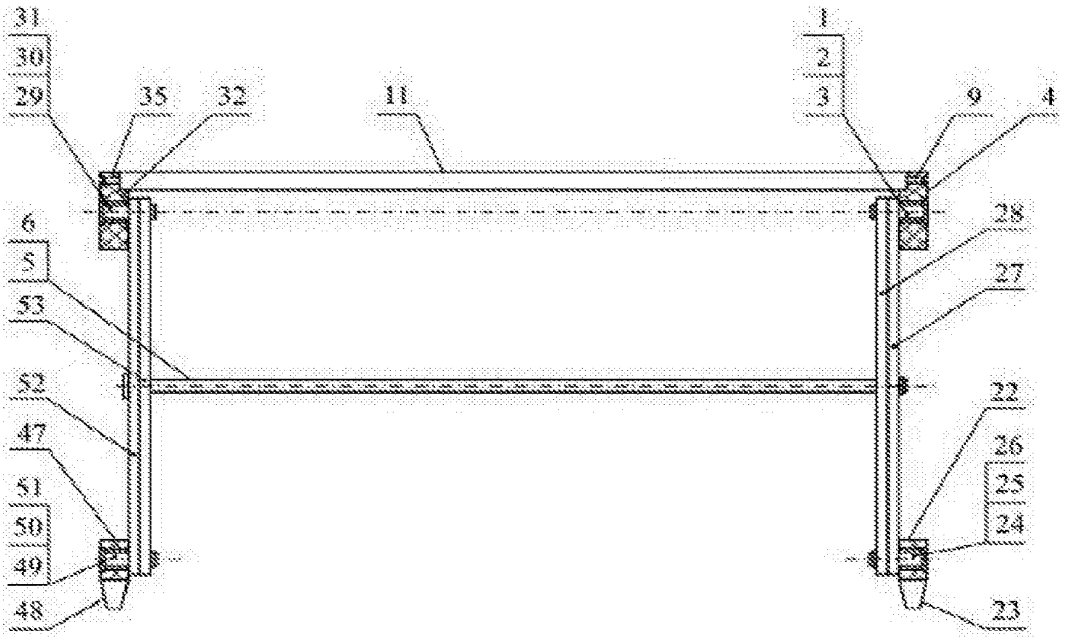

31
30
29
35
32
11
1
2
3
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25
24
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23

图5

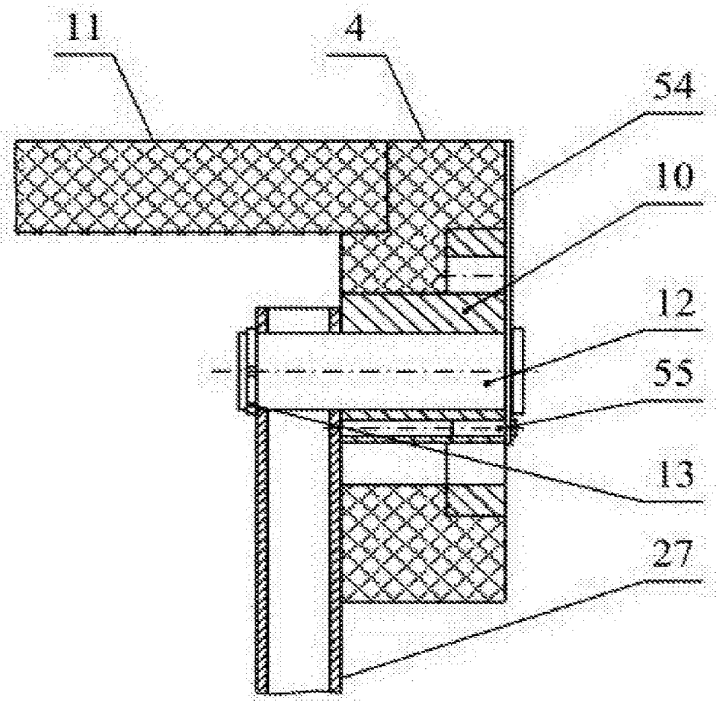

11
4
54
10
12
55
13
27

图6

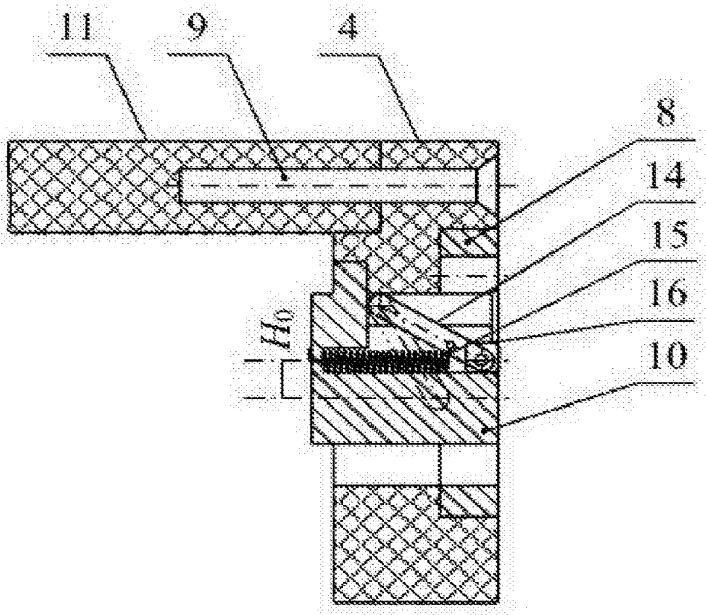


图7

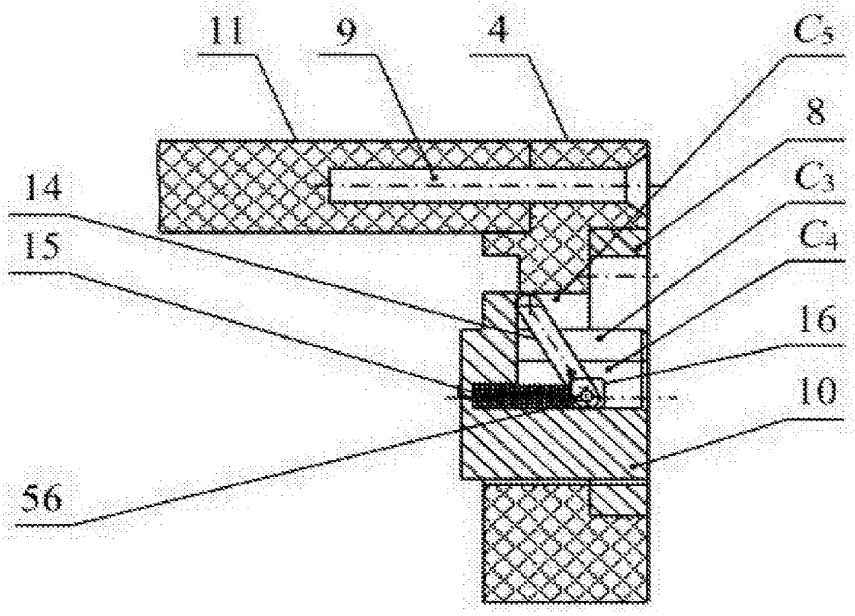


图8

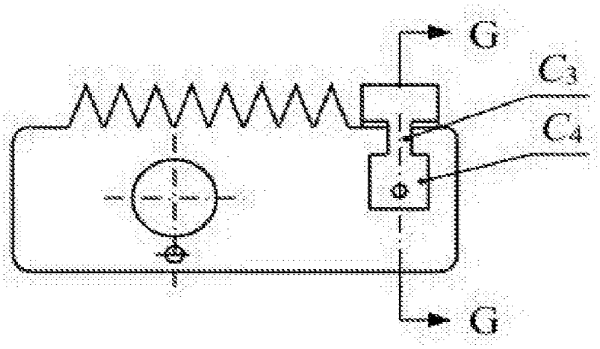


图9

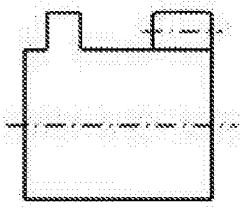


图10

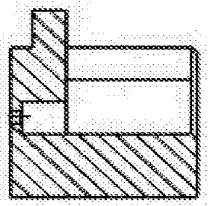


图11

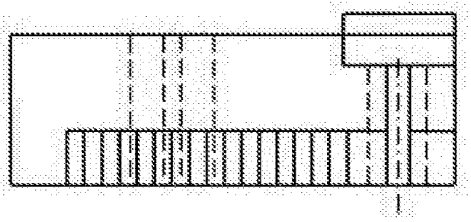


图12

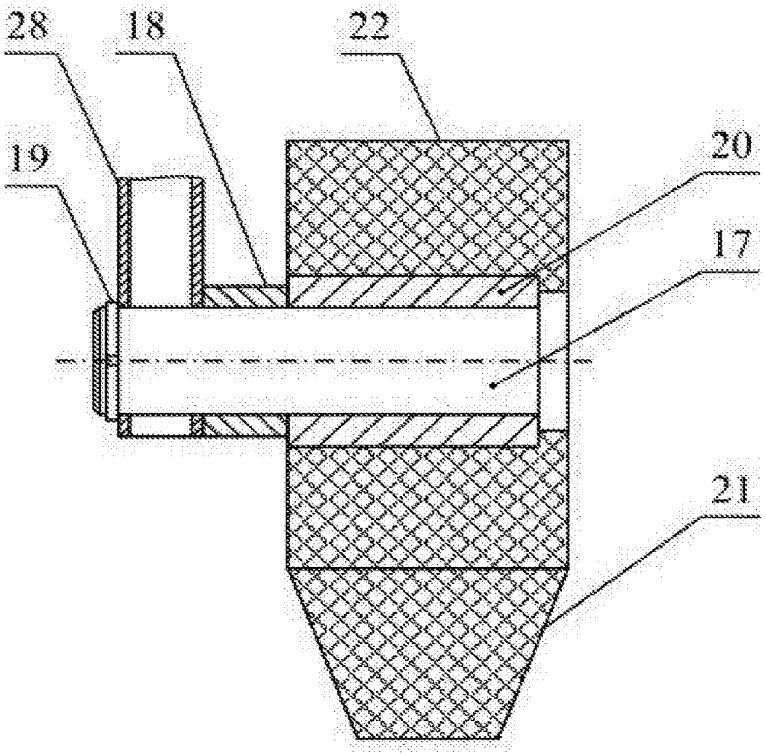


图13

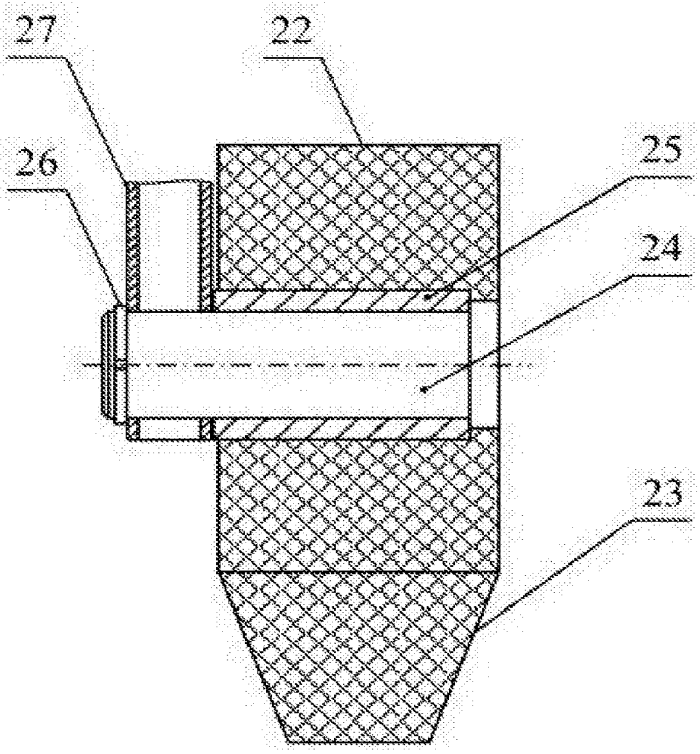


图14

15

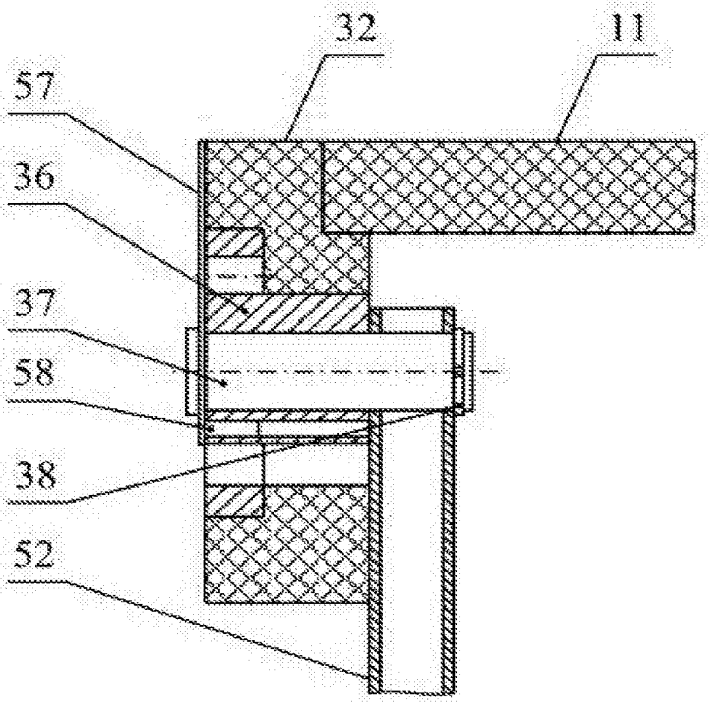


图15

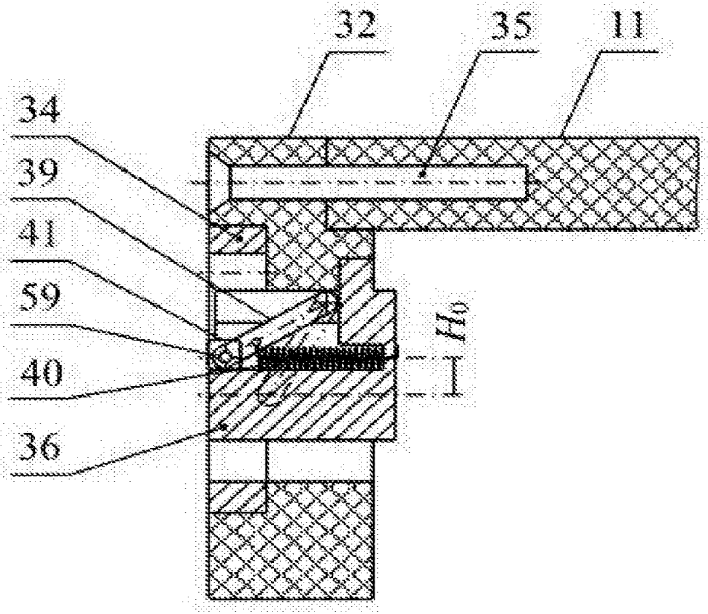


图16

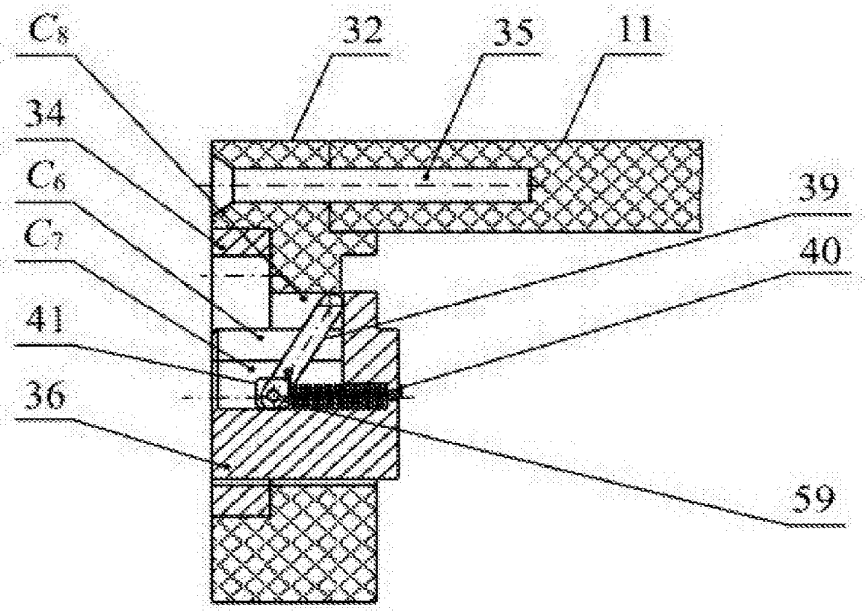


图17

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

App. No.:	17/493,830	Examiner:	WILKENS, Janet Marie
Filed:	October 4, 2021	Group Art Unit:	3637
Inventor:	Nathan Poniatowski	Confirmation No.	4682
Title:	DESKTOP WORKSPACE THAT ADJUSTS VERTICALLY	Customer No.:	155431
		Docket No.:	1001-001US13

Mail Stop Amendment
Commissioner for Patents
PO Box 1450
Alexandria, VA 2313-1450

I HEREBY CERTIFY THAT THIS CORRESPONDENCE, ALONG WITH ANY REFERRED TO AS BEING ATTACHED OR ENCLOSED, IS BEING TRANSMITTED VIA EFS-WEB TO THE USPTO ON DECEMBER 29, 2022.
/DANIEL T. LUND/, REG. NO. 58,614

AMENDMENT

Dear Commissioner:

This submission is responsive to the Office Action dated September 30, 2022.

Amendments to the Claims begin on page 2 of this paper.

Remarks begin on page 10 of this paper.

The Commissioner is authorized to charge any fees due to Deposit Account No. 60-2335.

Electronic Patent Application Fee Transmittal

Application Number:	17493830
Filing Date:	04-Oct-2021
Title of Invention:	DESKTOP WORKSPACE THAT ADJUSTS VERTICALLY
First Named Inventor/Applicant Name:	Nathan Mark Poniatowski
Filer:	Daniel Thomas Lund
Attorney Docket Number:	1001-001US13

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
INDEPENDENT CLAIMS IN EXCESS OF 3	2201	1	240	240
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	2806	1	130	130
		Total in USD ($)		**370**

REMARKS

Claims 1–4, 6–19, and 21–32 are pending, with claims 1, 11, 16, and 26 being independent. Claims 1–3, 6–11, 14–18, 21–26, and 28 are amended. Claims 31 and 32 are new and claims 5 and 20 are canceled. Applicant respectfully requests allowance of the currently pending claims for the following reasons:

Double Patenting

A terminal disclaimer is included with this submission. Accordingly, the double patenting rejection presented by the Office Action is moot.

Allowable Subject Matter

The Office Action did not reject claims 11 and 26 based on prior art. Claims 11 and 26 have been amended to independent form. Accordingly, claims 11 and 26 and dependent claims 10, 14, 25, and 28 are patentable for at least the reasons the Office Action did not reject claims 11 and 26 based on prior art.

In addition, the Office Action only rejected claims 5 and 20 under 35 U.S.C. 103 as being unpatentable over Li et al (CN105124920) in view of Ross et al (2003/0213415). Li was published on December 9, 2015. The present application claims the benefit of U.S. Provisional Patent Application No. 62/107,380, filed January 24, 2015. Accordingly, Li does not represent prior art with respect to claims supported by the provisional application and thereby having an effective priority date of January 24, 2015.

As amended, independent claim 1 recites the elements of claim 5. In addition, the term "gas spring" has been amended to "spring". As amended, claim 1 clearly has an effective priority date of January 24, 2015. As claim 5 was only rejected based on Li, the prior art rejections presented with respect to claim 1 are now moot.

Likewise, amended independent claim 16 is directed to the subject matter of claim 20 with the term "gas spring" amended to "spring." Amended claim 16 has an effective priority date of January 24, 2015, and the prior art rejections presented with respect to claim 16 are now moot.

Dependent claims 2-4, 6-9, 12, 13, 15 and 32 have an effective priority date of January 24, 2015 and are patentable for at least the reasons independent claim 1 is patentable. Dependent

claims 2-4, 6-9, 12, 13, 15 and 31 likewise have an effective priority date of January 24, 2015 and are patentable for at least the reasons independent claim 16 is patentable.

In this manner, each of the prior art rejections presented by Office Action are now moot, and all pending claims are in condition for allowance.

CONCLUSION

All claims in this application are in condition for allowance. Applicant does not acquiesce to any statements presented by the Office Action unless expressly acknowledged herein. Applicant respectfully requests reconsideration and prompt allowance of all pending claims.

In the event that all pending claims are not found allowable, Applicant requests the Examiner telephone the below-signed representative to discuss this application and expedite prosecution.

Date: December 29, 2022

By:
/Daniel T. Lund/
Daniel T. Lund, Reg. No. 58,614
Lund IP PLLC
Tel.: 651.968.0800
Customer No.: 155431

(19)中华人民共和国国家知识产权局

(12)实用新型专利

(10)授权公告号 CN 207186305 U
(45)授权公告日 2018.04.06

(21)申请号 201720305914.8

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代理人 林祖锋

(51)Int.Cl.
A47B 13/00(2006.01)
A47B 17/00(2006.01)

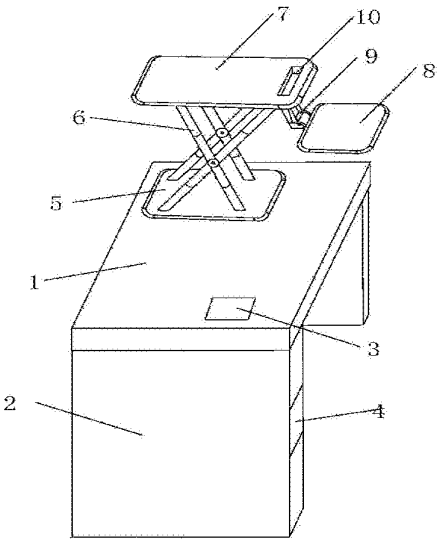
权利要求书1页 说明书3页 附图3页

(54)实用新型名称

一种站坐交替式升降班台

(57)摘要

一种站坐交替式升降班台，包括班台本体，所述班台本体上可拆卸连接有升降台，所述升降台包括底座及位于底座上通过升降结构支撑的升降台板，所述升降台板的一侧滑动连接有可转动折叠的副台板；所述升降结构包括两组可伸缩连接杆，每组连接杆由两根伸缩杆铰接呈X形，每根伸缩管由多节套管套接而成。久坐办公后，工作者将升降台置于办公桌的桌板上，可根据自身的身高调节升降结构，调到适合的位置后再将显示器置于升降台板上，键盘置于副台板上；既可实现站着办公。当站久站累后将取下显示器和键盘，将升降台折叠收拢。本实用新型实现坐站交替、不用久坐不动，健康办公新姿态。



CN 207186305 U

1.一种站坐交替式升降班台，包括班台本体，其特征在于：所述班台本体上可拆卸连接有升降台，所述升降台包括底座及位于底座上通过升降结构支撑的升降台板，所述升降台板的一侧滑动连接有可转动折叠的副台板；

所述升降结构包括两组可伸缩连接杆，每组连接杆由两根伸缩杆铰接呈X形，每根伸缩管由多节套管套接而成；

还包括与班台本体融为一体的垃圾回收机构，所述垃圾回收装置包括位于班台本体桌板上的存入通道及置于班台本体的支撑腿上的收纳腔，所述存入通道与收纳腔之间通过容纳腔贯通，容纳腔内设置有与其宽度匹配的活塞板，所述活塞板上连接有推动杆，推动杆延伸至容纳腔外，容纳腔与活塞板之间设有弹性件。

2.根据权利要求1所述的一种站坐交替式升降班台，其特征在于：还包括位于升降台板上的固定机构，所述固定机构包括用于与电子显示屏连接的固定架和锁紧机构；所述固定架包括金属材质的固定板，所述固定板的一侧与其垂直连接有金属材质的电子显示屏后挡板，固定板远离后挡板的一侧底面边缘位置设有锯齿状固定齿。

3.根据权利要求2所述的一种站坐交替式升降班台，其特征在于：所述固定板与后挡板通过连接轴转动连接。

4.根据权利要求2所述的一种站坐交替式升降班台，其特征在于：所述后挡板远离固定板的一侧与升降台板卡接。

5.根据权利要求2所述的一种站坐交替式升降班台，其特征在于：所述锁紧机构包磁铁。

一种站坐交替式升降班台

技术领域

[0001] 本实用新型涉及办公设施，具体涉及一种站坐交替式升降班台。

背景技术

[0002] 现有的办公室人员大都每天坐班八小时，工作时基本都是坐着上班。久坐不动易造成脑供血不足，反应变慢、颈椎受压迫、脊柱失去弹性、腰椎间盘受损、腰腹部赘肉加速滋生。同时，现有的办公桌附件为了方便丢纸屑跟烟灰都单独配置垃圾桶，在使用时，需要专门转向垃圾桶的位置投掷，投掷不准容易洒外面，需要再次去清洁，造成不便。

实用新型内容

[0003] 针对现有技术中所存在的不足，本实用新型提供了一种站坐交替式升降班台，上班不用一直坐着，根据需要通过调节升降台即可进行坐站交替式进行工作；同时，该办公桌自带垃圾回收机构，方便、整洁。

[0004] 为实现上述目的，本实用新型采用了如下的技术方案：一种站坐交替式升降班台，包括班台本体，所述班台本体上可拆卸连接有升降台，所述升降台包括底座及位于底座上通过升降结构支撑的升降台板，所述升降台板的一侧滑动连接有可转动折叠的副台板；

[0005] 所述升降结构包括两组可伸缩连接杆，每组连接杆由两根伸缩杆铰接呈X形，每根伸缩管由多节套管套接而成；

[0006] 还包括与班台本体融为一体的垃圾回收机构，所述垃圾回收装置包括位于班台本体桌板上的存入通道及置于班台本体的支撑腿上的收纳腔，所述存入通道与收纳腔之间通过容纳腔贯通，容纳腔内设置有与其宽度匹配的活塞板，所述活塞板上连接有推动杆，推动杆延伸至容纳腔外，容纳腔与活塞板之间设有弹性件。

[0007] 其中，还包括位于升降台板上的固定机构，所述固定机构包括用于与电子显示屏连接的固定架和锁紧机构；所述固定架包括金属材质的固定板，所述固定板的一侧与其垂直连接有金属材质的电子显示屏后挡板，固定板远离后挡板的一侧底面边缘位置设有锯齿状固定齿。

[0008] 具体地，所述固定板与后挡板通过连接轴转动连接。

[0009] 进一步地，所述后挡板远离固定板的一侧与升降台板卡接。

[0010] 进一步地，所述锁紧机构包磁铁。

[0011] 相比于现有技术，本实用新型具有如下有益效果：久坐办公后，工作者将升降台置于办公桌的桌板上，可根据自身的身高调节升降结构，调到适合的位置后再将显示器置于升降台板上，键盘置于副台板上；既可实现站着办公。当站久站累后将取下显示器和键盘，将升降台折叠收拢。本实用新型实现坐站交替、不用久坐不动，健康办公新姿态。同时，使用者可使用办公桌自动的垃圾回收机构进行烟灰、残渣、纸屑的回收，办公区环境、卫生、整洁。

附图说明

[0012] 图1为本实用新型整体结构示意图；

[0013] 图2为本实用新型升降台的结构示意图；

[0014] 图3为本实用新型中垃圾回收机构的结构示意图；

[0015] 图4为本实用新型显示器固定机构的结构示意图。

具体实施方式

[0016] 参见图1-图4，一种站坐交替式升降班台，包括班台本体，所述班台本体上可拆卸连接有升降台，所述升降台包括底座5及位于底座5上通过升降结构6支撑的升降台板7，使用时底座5固定在班台本体的桌板1上，升降台板7用于固定显示器，所述升降台板7的一侧滑动连接有可转动折叠的副台板8，副台板8与升降台板7通过滑槽10滑动连接；副台板8用于固定键盘。所述升降结构6包括两组可伸缩连接杆，每组连接杆由两根伸缩杆铰接呈X形，每根伸缩管由多节套管套接而成；使用者可以根据自己的习性通过调节套管的高度达到调节升降台板7高度的目的，最后实现显示器高度的调节。久坐办公后，工作者将升降台置于办公桌的桌板1上，可根据自身的身高调节升降结构6，调到适合的位置后再将显示器置于升降台板7上，键盘置于副台板8上；既可实现站着办公。当站久站累后将取下显示器和键盘，将升降台折叠收拢。本实用新型实现坐站交替、不用久坐不动，健康办公新姿态。副台板8与升降台板7之间通过铰接结构转动90°连接，所述翻转结构9包括与升降台板7底部连接的卡槽及与副台板8连接的转轴，转轴卡接在卡槽内实现转动，达到折叠调节的目的。

[0017] 另外，为了使显示器固定后更加稳定，显示器固定在升降台板7上后还可通过固定机构固定，所述固定机构包括用于与电子显示屏连接的固定架和锁紧机构；所述固定架包括金属材质的固定板11，所述固定板11的一侧与其垂直连接有金属材质的电子显示屏后挡板12，固定板11远离后挡板12的一侧底面边缘位置设有锯齿状固定齿15。具体地，所述固定板11与后挡板12通过连接轴13转动连接，所述后挡板12远离固定板11的一侧与升降台板7卡接。升降台板7上与副台板8相对的一侧的边缘位置开有与后挡板12匹配的卡槽，使用时，后挡板12卡在卡槽内，显示器固定后后侧与后挡板12抵触，上边沿通过锯齿状固定齿15卡固。收纳时，在后挡板12上固定一磁铁14，通过连接轴13转动固定板11，固定板11下折端部与磁铁14吸合，达到锁紧的目的。

[0018] 还包括与班台本体融为一体的垃圾回收机构，所述垃圾回收装置包括位于班台本体桌板1上的存入通道3及置于班台本体的支撑腿2上的收纳腔4，所述存入通道3与收纳腔4之间通过容纳腔31贯通，容纳腔31内设置有与其宽度匹配的活塞板32，所述活塞板32上连接有推动杆33，推动杆33延伸至容纳腔31外，容纳腔31与活塞板32之间设有弹簧34。使用者将残渣、烟灰、纸屑等垃圾通过存入通道3丢入容纳舱内，通过推压推动杆33，推动杆33推上的活塞板32推动垃圾从容纳腔31进入到收纳腔4，在弹簧34弹力的作用下，推动杆33带动活塞板32复位。待收纳腔4内的垃圾积攒后，使用者可抽出收纳腔4将垃圾倒掉后再将收纳腔4归位。使用者可使用办公桌自动的垃圾回收机构进行烟灰、残渣、纸屑的回收，办公区环境、卫生、整洁。

[0019] 最后说明的是，以上实施例仅用以说明本实用新型的技术方案而非限制，尽管参

照较佳实施例对本实用新型进行了详细说明，本领域的普通技术人员应当理解，可以对本实用新型的技术方案进行修改或者等同替换，而不脱离本实用新型技术方案的宗旨和范围，其均应涵盖在本实用新型的权利要求范围当中。

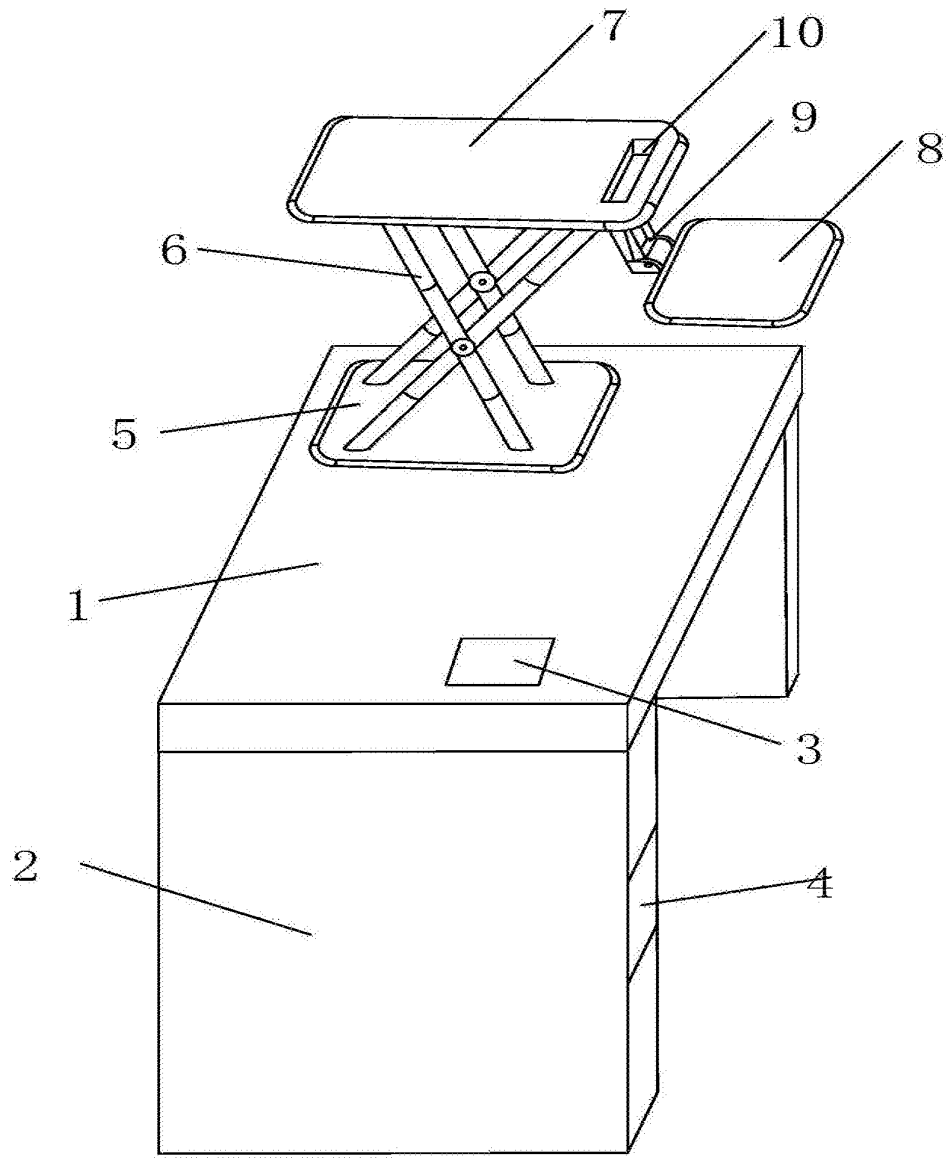


图1

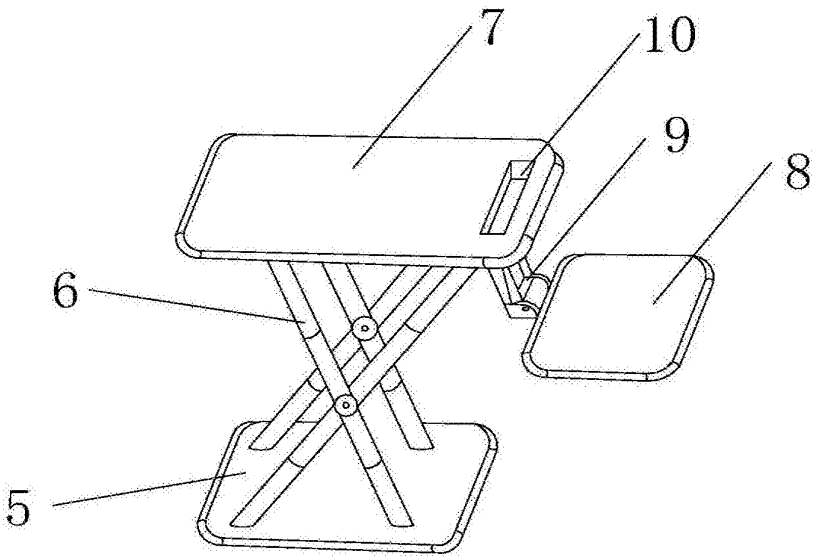


图2

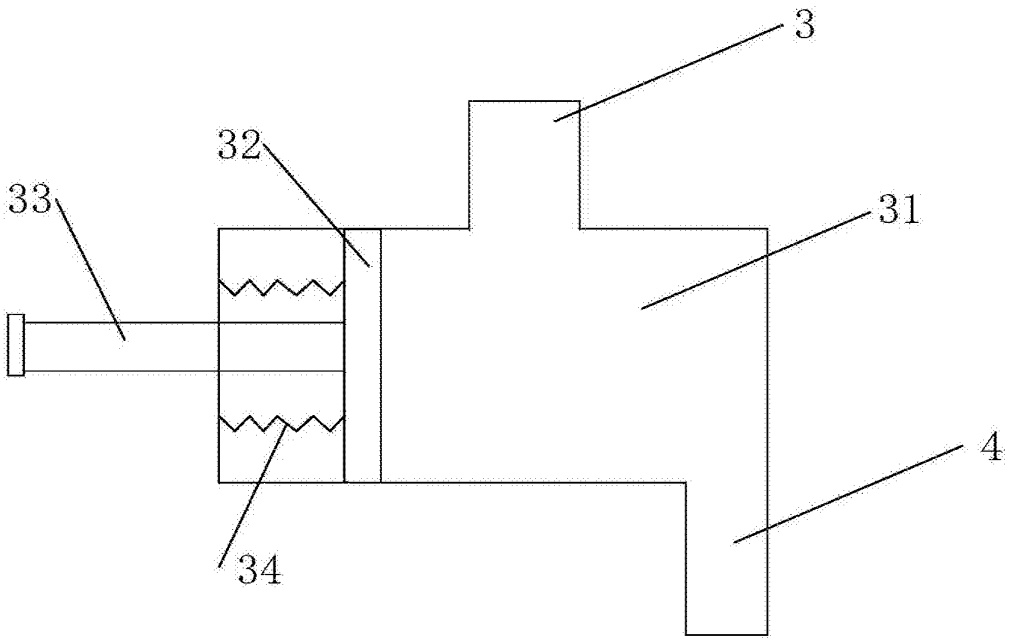


图3

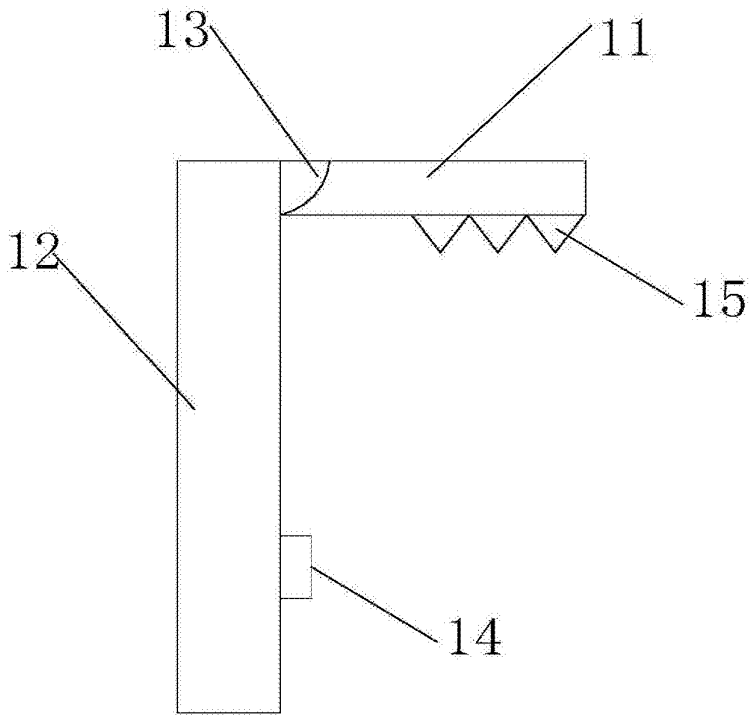


图4

PTO/SB/08a (01-22)
Approved for use through 05/31/2024. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	17493830
Filing Date	2021-10-04
First Named Inventor	Nathan Mark Poniatowski
Art Unit	3637
Examiner Name	Janet Marie WILKENS
Attorney Docket Number	1001-001US13

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	10159336	B2	2018-12-25	Liao et al.	
	2	11388989	B1	2022-07-19	Poniatowski	
	3	11388991	B1	2022-07-19	Poniatowski	
	4	11395544	B1	2022-07-26	Poniatowski	
	5	11464325	B1	2022-10-11	Poniatowski	
	6	3092918	A	1963-06-11	Haeussermann et al.	

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17493830
	Filing Date	2021-10-04
	First Named Inventor	Nathan Mark Poniatowski
	Art Unit	3637
	Examiner Name	Janet Marie WILKENS
	Attorney Docket Number	1001-001US13

	1	20040035332	A1	2004-02-26	Lin	
	2	20040040480	A1	2004-03-04	Hwang	
	3	20050029849	A1	2005-02-10	Goetz et al.	
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	Application Number	17493830
	Filing Date	2021-10-04
	First Named Inventor	Nathan Mark Poniatowski
	Art Unit	3637
	Examiner Name	Janet Marie WILKENS
	Attorney Docket Number	1001-001US13

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	Application Number	17493830
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	Art Unit	3637
	Examiner Name	Janet Marie WILKENS
	Attorney Docket Number	1001-001US13

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	1	207186305	CN	U	2018-04-06	任家中		☒
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	3	200479292	KR	Y1	2016-01-12	김승호		☒
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	First Named Inventor	Nathan Mark Poniatowski
	Art Unit	3637
	Examiner Name	Janet Marie WILKENS
	Attorney Docket Number	1001-001US13

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 3 : **A47C 19/04 // A61G 7/00 B66F 3/22**	**A1**	**(11) International Publication Number:** **WO 83/ 04168** **(43) International Publication Date:** 8 December 1983 (08.12.83)

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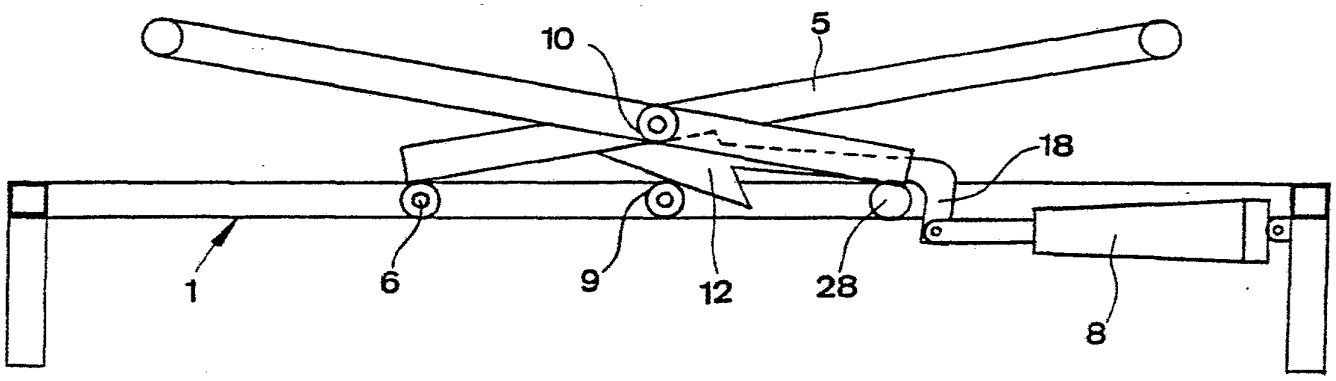
(71)(72) Applicant and Inventor: BERGENWALL, Henning [SE/SE]; Trollstigen 2, S-811 36 SANDVIKEN (SE).

(74) Agent: BJERKÉN, Jarl, Håkan; Gävle Patentbyrå AB, Box 304, S-801 04 Gävle 1 (SE).

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Published
With international search report.
In English translation (filed in Swedish).

(54) Title: A DEVICE FOR RAISING AND LOWERING OBJECTS, SUCH AS BED FRAMES, W ORK TABLES OR THE LIKE



(57) Abstract

A device for raising and lowering objects comprises a stand (1), and arm (5) pivotably supported on the stand for carrying a bed frame or the like, a power mechanism (8) for pivoting the arm (5) and a wedge (12) which is insertable between portions of the stand and arm in order to actuate these portions away from each other and thereby pivot the arm upwardly from the stand. The wedge (12) is movable perpendicularly to the pivot axis (6) of the arm (5) and is connected to a dog (18) adapted to abut a component (28) connected to the arm (5) after a certain initial introduction of the wedge between said portions (9, 10).

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A device for raising and lowering objects, such as bed frames, work tables or the like

FIELD OF INVENTION AND PRIOR ART

This invention relates to a device of the kind defined in the preamble of appendant claim 1.

Such a device is known by FR-A 1 560 817. In this device, the element producing the wedge action is formed by a slide, which is guidedly movable in a horisontal path. The element has the character of a long beam, at the outer end of which the wedge portion is arranged. When the wedge portion, which apart from the contact with the support arm is freely located, urges the support arm to pivot upwardly, the element is exposed to a downwardly directed force giving rise to a torque, which may cause jamming with regard to the guiding of the element relative to the stand since this guide has to maintain the element in the horisontal path of movement and prevent pivoting downwardly of the wedge portion. Furthermore, a hinge between the wedge element and the power mechanism is, in the device according to the patent, located above the area of contact between the dog and the support arm or the part connected thereto, which on displacement of the element in order to pivot the support arm upwardly, gives rise to a torque on the element tending to pivot its wedge portion downwardly, which causes additional risk of jamming and loss of energy.

BRIEF DISCLOSURE OF THE INVENTION

The object of the invention is to devise a way for reducing the deficiencies discussed hereinabove.

This object is primarily obtained by that defined in the characteristic of claim 1. In this way, an embodiment is obtained, in which the forces acting on the wedge portion of the element in a direction downwardly during lifting of the support arm are balanced by means of the portion of the stand located therebelow so that the guide

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problems occurring in the French patent discussed previously are eliminated. This is in particular due to the fact that the mobility of the wedge portion in a vertical sense eliminates such breaking stresses which may occur in the device according to the patent by those guides which serve to maintain the element in its horisontal path of movement. Moreover, the design according to the invention makes it possible to obtain, by location of the hinge between the wedge element and the power mechanism below the area of contact of the dog, such actuation of the wedge portion that it will move upwardly during pivoting upwardly of the arm. Thus, the wedge element will urge the arm upwardly also when the proper wedge action has been terminated, i.e. when the wedge portion has entered out of contact with the stand.

SHORT DESCRIPTION OF THE DRAWINGS

With reference to the appended drawings, a more specific description of an embodiment example of the invention will follow hereinafter.

In the drawings:

fig 1 is a view from the side of the device according to the invention with the support arm lowered;

fig 2 is a plan view of fig 1;

fig 3 is a view illustrating the support arm somewhat pivoted upwardly; and

fig 4 is a view illustrating the support art fully pivoted upwardly.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

The device illustrated in the drawings for raising and lowering objects comprises a stand 1 having two longitudinal beams 2 and cross beams 3 arranged at the ends of beams 2. Legs 4 are provided at the outer ends of the cross beams. A support arm 5 is pivotably journalled to the stand about a generally horisontal axis 6. The object to be handled, such as a bed frame, a work table

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or the like, may be attached in a manner known per se at the upper end of support arm 5 and the cross piece 7 provided thereon. A power mechanism 8 is adapted to pivot arm 5. The mechanism is constituted by a piston cylinder mechanism.

The mechanism 8 is connected to an element 11 which is introducable between portions 9 and 10 of the stand 1 and support arm 5 respectively, said element producing, in cooperation with said portions 9, 10, a wedge action tending to pivot the arm upwardly from the stand.

The element 11 is displaceable generally perpendicularly to the pivot axis 6 of arm 5 and has a wedge shaped forward portion 12. This portion has two surfaces 13 and 14 diverging from the tip of the wedge and adapted to contact portions 9 and 10 respectively.

A second arm 15 is connected to arm 5 via an axis 16 parallel to axis 6. The arm 15 has a portion 17 protruding from the axis 16, the end of said portion being attached to a cross member 28, the opposite ends of which are received in separated guides on the inner sides of the longitudinal beams 2 in such a manner that cross member 18 is displaceable reciprocatingly in the guides and also rotatable about an axis parallel to the pivot axis 6 of arm 5.

The mechanism 8 and element 11 are associated to a dog 18, which is adapted to, after displacement of the wedge portion 12 of the element in a certain degree into a position between portions 9 and 10, abut cross member 28 in order to apply the force developed by the mechanism thereon. The dog 18 is formed by a downwardly directed projection on the element. This projection is connected to wedge portion 12 by means of an intermediate portion 19 extending at an angle to the projection.

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Preferably, the arms 5 and 15 are coordinated with the axis 16 between the ends of the arms like a pair of scissors so that also arm 15 with a cross piece 20 located at the end opposite to the cross member 28 may take part in supporting the object in question. On the cross member 28, guide surfaces 21 may be provided, between which portion 19 of element 11 is movable.

The dog 18 is rigidly associated to the connecting portion 19, which in turn is rigidly connected to wedge portion 12. However, the mechanism 8 is hingedly connected (hinge 22) to the outer end of projection 18. The hinge 22 is located below that location where the projection 18 is adapted to contact cross member 28 so that a tendency to pivoting upwardly of wedge portion 12 is obtained on expansion of mechanism 8.

The portions on which the wedge surfaces 13 and 14 actuate are formed by a stationary portion on the stand and a portion located in the area of the hinge 16 between arms 5 and 15. The portion 9 is formed by means of a cross piece 23 extending between the longitudinal beams 2. The cross piece 23 may be provided with a roller to reduce friction relative to wedge surface 13. Another roller 24 may be journalled about axis 16 between arms 5 and 15, said roller being intended for contact with wedge surface 14 and forming said contact portion 10. As appears from figs 1 and 2, arms 5 and 15 are parallell to the upper surface of the stand when the device is folded. Further, it appears from fig 1 that the wedge portion 12, when element 11 is maximally retracted by mechanism 8, has its tip retained between the portions or rollers 9 and 10.

The device operates as follows: If it is desired to raise an object carried on the cross pieces 7 and 20 starting from the position according to fig 1, the mechanism 8 is supplied with pressure fluid so as to be extended. This causes wedge portion 12 to be introduced between portions 9 and 10 and separate them as illustrated in fig 3. Since the pivot axis 6 of arm 5 in this case is

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stationary relative to the stand, the cross member 28 is displaced in guides 19. By the design of wedge portion 12, a comparatively small amount of power of mechanism 8 is required to obtain initial pivoting upwardly of arms 5 and 15. After some additional expansion of mechanism 8, dog 18 will hit on cross member 28 so that power from mechanism 8 now is applied on said cross member. During continued extension of mechanism 8, the arms are pivoted relative to each other to the position according to fig 4. The forward wedge portion 12 of element 11 is maintained pivoted upwardly and in contact with roller 24 by the torque exerted on the element due to the location of hinge 22 below the contact area between dog 18 and cross member 28.

Modifications of the device are of course possible within the scope of the invention.

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Claims

1. A device for raising and lowering objects, such as bed frames, work tables or the like, comprising a stand (1), at least one arm (5) pivotably carried by the stand, said arm being adapted to support the object in question, a power mechanism (8) for pivoting the support arm, and an element (11) connected to the mechanism, said element being, by means of said mechanism (8), displaceable generally perpendicularly to the pivot axis (6) of the support arm (5) and designed to provide, in cooperation with a portion (10) of the support arm, a wedge action tending to pivot said portion and thereby the support arm (5) upwardly from the base, said mechanism (8) and element (11) being connected to a dog (18), which is adapted to, starting from a maximally downwardly pivoted position of the support arm (5), engage the support arm (5) or a part (28) connected thereto after an initial displacement of the element (11) and associated initial pivoting upwardly of the support arm (5) and apply power developed by said mechanism (8) on the support arm (5) or the part connected thereto for the remaining pivoting upwardly of the support arm (5), c h a r a c t e r i z e d in that a portion (12) of the element (11) which provides the wedge action is vertically movable and introducable between said portion (10) of the support arm (5) and a portion (9) of the stand located therebelow so as to move said portions (9, 10) away from each other by wedging contact therewith.

2. A device according to claim 1, a second arm (15) being hingedly connected to the first mentioned arm (5) and having an end portion facing away from said first arm (5) cooperating with a guide (19) arranged in the stand and extending at an angle to the pivot axis (6) of the first arm, said second arm being displaceable and pivotable relative to said guide, said dog (18) being adapted to actuate the second arm (15) and rigidly connected to the element and wedge portion, said element (11)

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being hingedly connected (about axis 22) to the power mechanism (8) c h a r a c t e r i z e d in that the hinge (22) between the element (11) and the mechanism (8) is disposed below the contact area between the dog (18) and the second arm (15) to obtain actuation of the wedge portion (12) upwardly when the mechanism (8) urges the dog against the second arm.

3. A device according to claim 2, said portion (10) of the first arm (5) being formed by a roller arranged about a pin shaft (16) forming the hinge between the arms, c h a r a c t e r i z e d in that the portion (9) on the stand (1) is formed by a second roller.

4. A device according to claim 1 or 2, c h a r a c - t e r i z e d in that the wedge portion (12) has its outer end retained between said portions (9, 10) of the first arm (5) and the stand when said arm is maximally pivoted downwardly towards the stand and the element (11) is maximally retracted.

5. A device according to claim 1 or 2, said element (11) having a generally horisontal extent in its maximally retracted position and the wedge portion (12) having an upper upwardly sloping wedge surface (14), c h a - r a c t e r i z e d in that the wedge portion (12) in the retracted position of the element has a downwardly sloping second wedge surface (13) for cooperation with said portion (9) of the stand.

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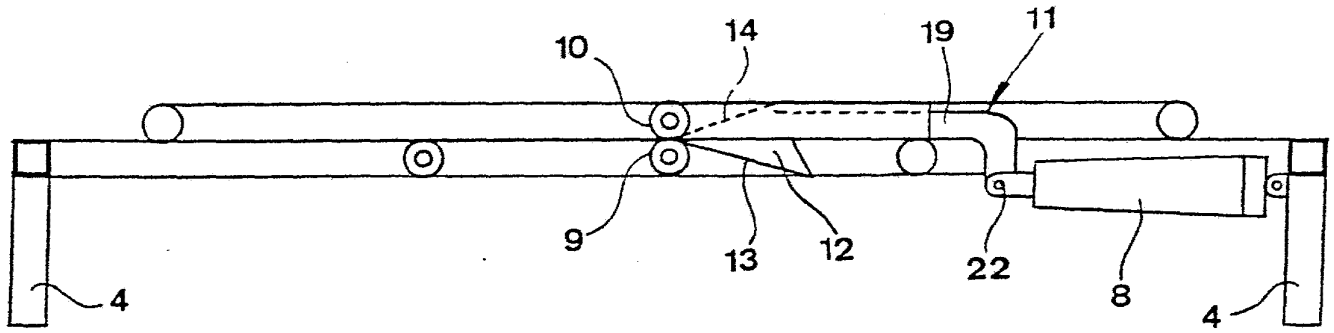


Fig 1

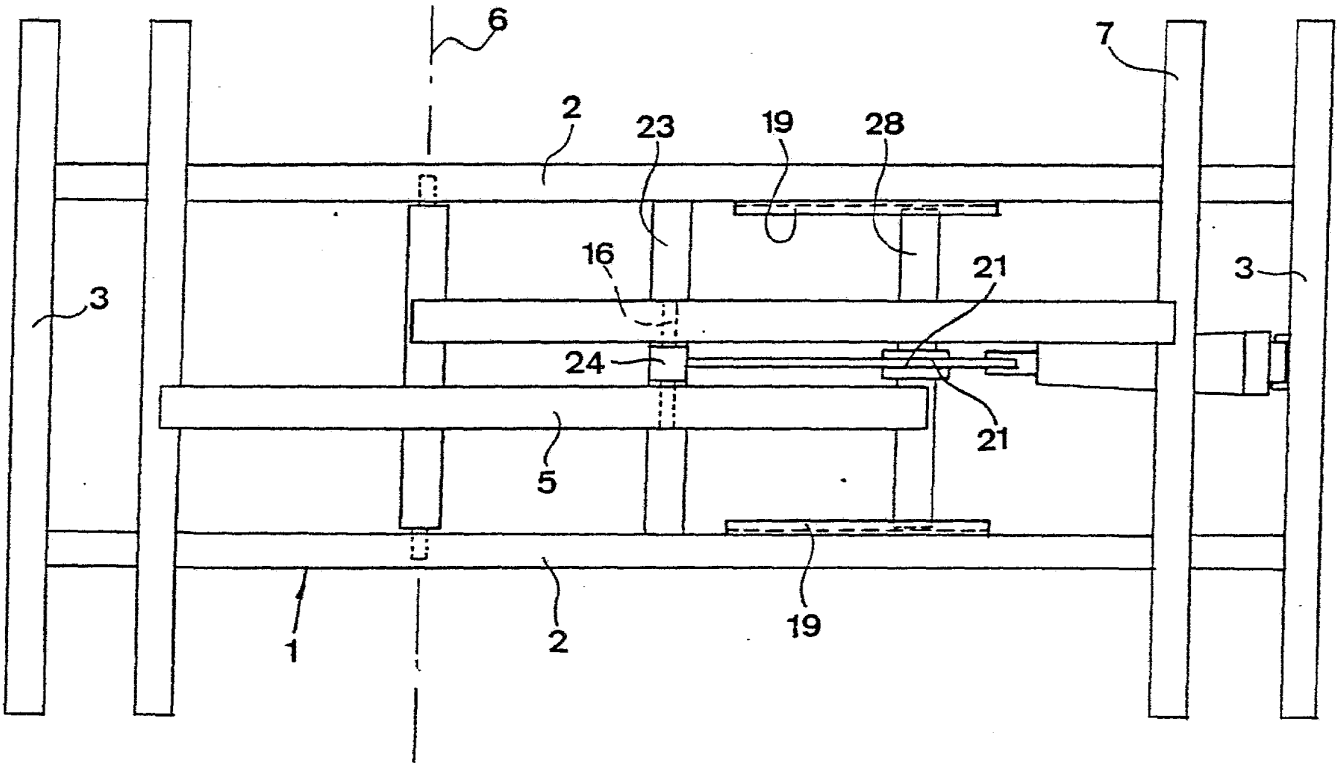


Fig 2

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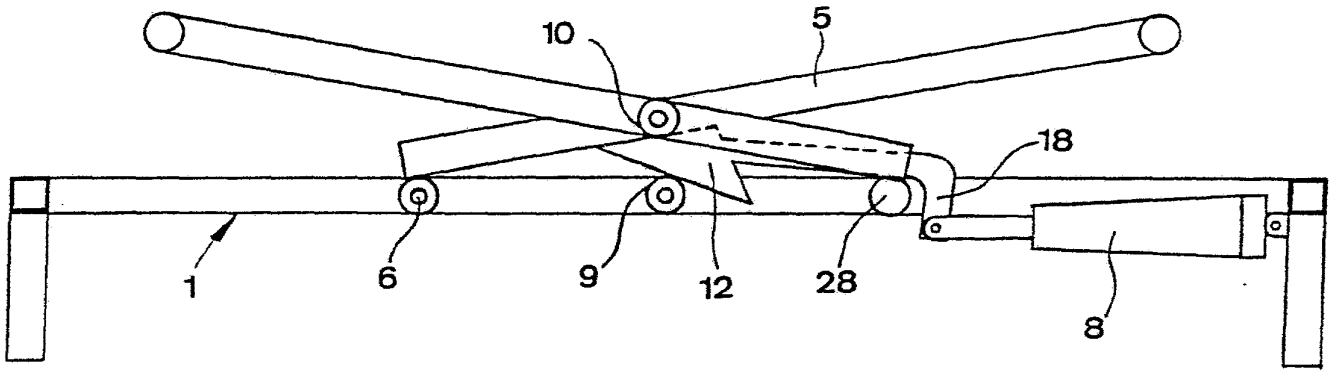


Fig 3

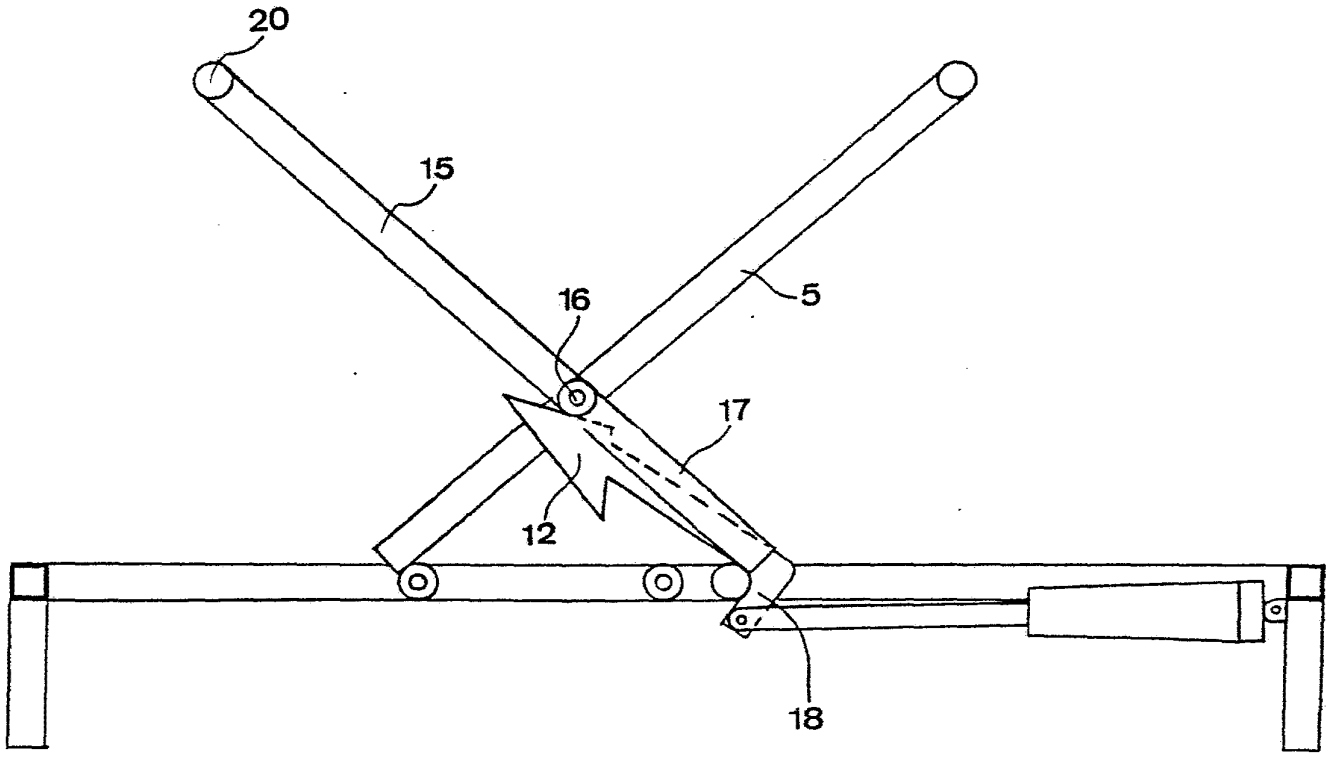


Fig 4

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INTERNATIONAL SEARCH REPORT

International Application No PCT/SE83/00192

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [3]

According to International Patent Classification (IPC) or to both National Classification and IPC 3

A 47 C 19/04 // A 61 G 7/00, B 66 F 3/22

II. FIELDS SEARCHED

Minimum Documentation Searched [4]

Classification System	Classification Symbols
IPC 3	A 47 C 19/00,04, A 61 G 1/02, 7/00, B 66 F 3/22
US Cl	5:63-65; 254:8, 9, 122; 296:20

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched [5]

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III. DOCUMENTS CONSIDERED TO BE RELEVANT [14]

Category *	Citation of Document, [16] with indication, where appropriate, of the relevant passages [17]	Relevant to Claim No. [18]
A	DE, B , 1 082 023 (I TREPEL) 19 May 1960	1
A	FR, A , 1 560 817 (E VON RÜDGISCH) 21 March 1969 See fig 4 and 5	1

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IV. CERTIFICATION

Date of the Actual Completion of the International Search [2]	Date of Mailing of this International Search Report [2]
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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/493,830	Poniatowski, Nathan Mark
	Examiner	Art Unit
	JANET M WILKENS	3637

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
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CLAIMS

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	09/26/2022	01/25/2023							
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	4	✓	✓							
	5	✓	-							
	6	✓	✓							
	7	✓	✓							
	8	✓	✓							
	9	✓	✓							
	10	✓	=							
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	12	✓	✓							
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	14	✓	=							
	15	✓	✓							
	16	✓	✓							
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	24	✓	✓							
	25	✓	=							
	26	✓	=							
	27	✓	✓							
	28	✓	=							
	29	✓	✓							
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Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-22)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	17493830
Filing Date	2021-10-04
First Named Inventor	Nathan Mark Poniatowski
Art Unit	3637
Examiner Name	Janet Marie WILKENS
Attorney Docket Number	1001-001US13

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	10159336	B2	2018-12-25	Liao et al.	
	2	11388989	B1	2022-07-19	Poniatowski	
	3	11388991	B1	2022-07-19	Poniatowski	
	4	11395544	B1	2022-07-26	Poniatowski	
	5	11464325	B1	2022-10-11	Poniatowski	
	6	3092918	A	1963-06-11	Haeussermann et al.	

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	First Named Inventor	Nathan Mark Poniatowski
	Art Unit	3637
	Examiner Name	Janet Marie WILKENS
	Attorney Docket Number	1001-001US13

	1	20040035332	A1	2004-02-26	Lin	
	2	20040040480	A1	2004-03-04	Hwang	
	3	20050029849	A1	2005-02-10	Goetz et al.	
	4	20090090832	A1	2009-04-09	Mileos et al.	
	5	20090146389	A1	2009-06-11	Borisoff	
	6	20090200437	A1	2009-08-13	Smed	
	7	20110001033	A1	2011-01-06	Kohl et al.	
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	9	20130145972	A1	2013-06-13	Knox et al.	
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	11	20140158026	A1	2014-06-12	Flaherty	

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	Examiner Name	Janet Marie WILKENS
	Attorney Docket Number	1001-001US13

	12	20150232005	A1	2015-08-20	Haller et al.	
	13	20150274038	A1	2015-10-01	Garing	
	14	20150368082	A1	2015-12-24	Davis et al.	
	15	20150375896	A1	2015-12-31	Taylor et al.	
	16	20160051042	A1	2016-02-25	Koch	
	17	20160060084	A1	2016-03-03	Baudermann	
	18	20160106205	A1	2016-04-21	Hall et al.	
	19	20160170402	A1	2016-06-16	Lindström	
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	21	20160260019	A1	2016-09-08	Ruiz et al.	
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Attorney Docket Number	1001-001US13

	23	20170174486	A1	2017-06-22	Kochie et al.	
	24	20170360192	A1	2017-12-21	Hu	
	25	20180008037	A1	2018-01-11	Laudadio	
	26	20180055214	A1	2018-03-01	Kim et al.	
	27	20180103752	A1	2018-04-19	ZHONG	
	28	20180255919	A1	2018-09-13	Swartz et al.	
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	1	207186305	CN	U	2018-04-06	任家中		☒
	2	9302967	DE	U1	1993-04-22	JANZEN		☒

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Examiner Name	Janet Marie WILKENS
Attorney Docket Number	1001-001US13

	3	200479292	KR	Y1	2016-01-12	김승호		☒
	4	8304168	WO	A1	1983-12-08	Bergenwall		☐
	5	107048694	CN	A	2017-08-18	Dai et al.		☐

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Examiner Signature	/JANET M WILKENS/	Date Considered	01/24/2023

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Art Unit	3637
Examiner Name	Janet Marie WILKENS
Attorney Docket Number	1001-001US13

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Daniel T. Lund/	Date (YYYY-MM-DD)	2022-12-29
Name/Print	Daniel T. Lund	Registration Number	58614

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	840	A47B1/03.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/01/10 01:10 PM
L2	16932	A47B21/0314,00,02,03.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/01/10 01:13 PM
L3	4723	A47B21/0314.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/01/10 01:13 PM
L4	1130	A47B21/0314.cpc. AND spring	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/01/10 01:13 PM
L5	37	(Artificial Intelligence) More like doc: US-11160367-B1 Text: (US-10575630-B1 OR US-10568416-B1 OR US-11140977-B1 OR GB-2575456-A OR US-10244861-B1 OR US-20180103752-A1 OR US-10258149-B2 OR US-11134773-B1 OR US-20130014674-A1 OR US-11147366-B1 OR US-10856651-B2 OR US-5588377-A OR US-20130014675-A1 OR US-10842257-B2 OR US-11134774-B1 OR US-20200015584-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/01/10 01:13 PM

		A1 OR US-11054797-B2 OR US-9326598-B1 OR EP-3593671-A1 OR US-10893748-B1).did.					
L6	40	(Artificial Intelligence) More like doc: US-11134774-B1 Text: (US-10575630-B1 OR US-10568416-B1 OR US-11140977-B1 OR US-11160367-B1 OR US-10244861-B1 OR US-11134773-B1 OR US-20200221864-A1 OR US-20130014674-A1 OR US-11147366-B1 OR US-20180177289-A1 OR US-20130014675-A1 OR US-5588377-A OR US-9326598-B1 OR US-10893748-B1 OR US-10869549-B2 OR ES-2430597-T3 OR US-8303062-B2 OR CN-107257640-B OR US-20140246841-A1 OR US-20180055214-A1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/01/10 01:14 PM
L7	57	(Artificial Intelligence) More like doc: CN-107744256-A Text: (CN-105179902-B OR CN-109077456-A OR CN-209235239-U OR CN-108937157-A OR CN-213046230-U OR CN-209203813-U OR CN-208394705-U OR CN-107041626-B OR CN-110141042-A OR CN-206246969-U OR CN-107744256-B OR CN-108968333-A OR CN-205214602-U OR CN-107157193-A OR CN-205358710-U OR CN-110025127-A OR CN-108783884-A OR CN-108771320-A OR CN-107041626-A OR DE-2810270-C2).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/01/10 02:14 PM
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			DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L9	2683	A47B21/00,02,03.cpc. AND spring	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/01/10 02:30 PM
L10	2380	A47B9/16.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/01/10 03:24 PM
L11	2002	A47B2021/0321,0364.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/01/10 03:37 PM
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L19	1065	A47B3/02,0809,0815.cpc. AND spring	(US-PGPUB; USPAT; USOCR; FIT (AU, AP,	OR	ON	ON	2022/01/10 09:29 PM

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L21	503	Poniatowski.in.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/01/10 09:36 PM
L22	30	("4448386"|"9668572"|"7841570"|"8684339"|"20120188302"|"8671853"|"9504316"|"10244861"|"2843418"|"5722513"|"9326598"|"8544391"|"9480332"|"9554644"|"4941641"|"5251864"|"5957426"|"7246784"|"9681746"|"9049923"|"4640488"|"4753419"|"9326598"|"10114352"|"8931750"|"8931750"|"20070001077"|"20180213929"|"4702454"|"7950338"|"8132518").PN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/01/10 09:38 PM
L23	492	A47B3/00.cpc. AND spring	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/01/10 09:39 PM
L24	946	A47B61/00.cpc. AND spring	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/01/10 09:40 PM
L25	24	("10244861"|"20180213929"|"9326598"|"96817	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/01/12 08:08 AM

		46"|"8931750"|"7246784"|"10114352"|"5957426"|"5722513"|"4640488"|"5251864"|"4448386"|"4702454"|"2843418"|"9668572"|"20070001077"|"4753419"|"11083282"|"20170196351"|"D854775"|"20160249737"|"20120188302"|"10575630").PN.					
L26	39	("2156148" | "3245366" | "4691888" | "5588377" | "8544391" | "9326598" | "9480332" | "9504316" | "20040040480" | "20080203865" | "20130139736" | "20140041554" | "20150216296" | "20150289641" | "20160286951" | "20160338486").pn. OR ("9681746").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/01/12 08:10 AM
L27	24	("2531856" | "3727245" | "4611823" | "5447319" | "5722513" | "6974185" | "8016305" | "8544391" | "9326598" | "20040040480").pn. OR ("9480332").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/01/12 08:15 AM
L28	55	("3410328" | "4032103" | "4405116" | "4558648" | "4577821" | "4753419" | "5192053" | "5299906" | "5605056" | "5722513" | "5771816" | "5833198" | "5957426" | "6056459" | "6269965" | "6336627" | "6427607" | "6705238" | "7048236").pn. OR ("7246784").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/01/12 08:21 AM
L29	109	("20040040480"|"9055810"|"8671853"|"20090200437"|"6722618"|"9554644"|"1318564"|"20130145972"|"4843978"|"6269753"|"9326598"|"5626323"|"9504316"|"20030213415"|"20140144352"|"20040035332"|"20	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/01/12 08:25 AM

		090090832"|"4577821"|"8132518"|"9480332"|"20070080564"|"5829948").PN.					
L30	23	("20040040480"|"9055810"|"8671853"|"20090200437"|"6722618"|"9554644"|"1318564"|"20130145972"|"4843978"|"6269753"|"9326598"|"5626323"|"9504316"|"20030213415"|"20140144352"|"20040035332"|"20090090832"|"4577821"|"8132518"|"9480332"|"20070080564"|"5829948").PN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/01/12 08:26 AM
L31	20	"10292510"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/01/13 07:37 AM
L32	842	A47B1/03.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/04 12:03 PM
L33	16969	A47B21/0314,00,02,03.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/04 12:03 PM
L34	4736	A47B21/0314.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/04 12:03 PM
L35	1134	A47B21/0314.cpc. AND spring	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT;	OR	ON	ON	2022/02/04 12:03 PM

			IBM_TDB)				
L36	38	(Artificial Intelligence) More like doc: US-11160367-B1 Text: (US-10575630-B1 OR US-10568416-B1 OR US-11140977-B1 OR GB-2575456-A OR US-10244861-B1 OR US-11134773-B1 OR US-20130014674-A1 OR US-11147366-B1 OR US-20200245756-A1 OR CN-109700183-A OR US-5588377-A OR US-20130014675-A1 OR US-11134774-B1 OR US-20200015584-A1 OR US-9326598-B1 OR EP-3593671-A1 OR US-10893748-B1 OR EP-3593671-B1 OR ES-2430597-T3 OR US-8303062-B2).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/04 12:03 PM
L37	41	(Artificial Intelligence) More like doc: US-11134774-B1 Text: (US-10575630-B1 OR US-10568416-B1 OR US-11140977-B1 OR US-11160367-B1 OR US-10244861-B1 OR US-11134773-B1 OR US-20130014674-A1 OR US-11147366-B1 OR US-20130014675-A1 OR US-20200245756-A1 OR US-5588377-A OR CA-1239863-A OR US-9326598-B1 OR US-10893748-B1 OR US-10869549-B2 OR ES-2430597-T3 OR US-8303062-B2 OR CN-107257640-B OR US-20140246841-A1 OR US-10849424-B2).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/04 12:03 PM
L38	59	(Artificial Intelligence) More like doc: CN-107744256-A Text: (CN-105179902-B OR CN-109077456-A OR CN-209235239-U OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS,	OR	ON	ON	2022/02/04 12:03 PM

		CN-110141042-A OR CN-209203813-U OR CN-213046230-U OR CN-208394705-U OR CN-107041626-B OR CN-205813954-U OR CN-110025127-A OR CN-107744256-B OR CN-108968333-A OR CN-106473451-A OR CN-107157193-A OR CN-205214602-U OR CN-204113150-U OR CN-108783884-A OR CN-108771320-A OR CN-107041626-A OR CN-110547593-A).did.	IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L39	13392	A47B21/00,02,03.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/04 12:03 PM
L40	2696	A47B21/00,02,03.cpc. AND spring	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/04 12:03 PM
L41	2391	A47B9/16.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/04 12:03 PM
L42	2010	A47B2021/0321,0364.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/04 12:03 PM
L43	65	("1318564" | "2937003" | "3295800" | "4221280" | "4558648" | "4577821" | "4843978" | "5588377" | "5626323" | "5829948" | "5957426" | "6098961" | "6269753" | "6516478"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/02/04 12:03 PM

		| "6533479" | "6722618" | "6742768" | "8132518" | "8671853" | "9049923" | "9055810" | "9326598" | "9480332" | "9504316" | "9554644" | "20030213415" | "20040035332" | "20040040480" | "20070080564" | "20080000393" | "20090090832" | "20090200437" | "20110001033" | "20110024958" | "20120097822" | "20130145972" | "20130193392" | "20140144352" | "20150232005" | "20150375896" | "20160338486" | "20170174486" | "20180008037").pn. OR ("10244861").urpn. AND (PGPB | USPT | USOC).dbnm.					
L44	1313	312/208.1,223.3.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/04 12:03 PM
L45	1602	248/421,562,588,585,431,432,439.ccls. AND spring	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/04 12:03 PM
L46	2342	108/147,144.11,145.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/04 12:03 PM
L47	2629	108/93,96,116-118,120.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO;	OR	ON	ON	2022/02/04 12:03 PM

			JPO; DERWENT; IBM_TDB)				
L48	2515	108/43,138,50.01,50.02.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/04 12:03 PM
L49	3570	A47B3/02,0809,0815.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/04 12:03 PM
L50	1070	A47B3/02,0809,0815.cpc. AND spring	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/04 12:03 PM
L51	567	A47B2003/025.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/04 12:03 PM
L52	503	Poniatowski.in.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/04 12:03 PM
L53	30	("4448386"|"9668572"|"7841570"|"8684339"|"20120188302"|"8671853"|"9504316"|"10244861"|"2843418"|"5722513"|"9326598"|"8544391"|"9480332"|"9554644"|"4941641"|"5251864"|"5957426"|"7246784"|"9681746"|"9049923"|"4640488"|"4753419"|"9326598"|"10114352"|"8931750"|"8931750"|"20070001077"|"20180213929"|	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/02/04 12:03 PM

		4702454"|"7950338"|"8132518").PN.					
L54	495	A47B3/00.cpc. AND spring	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/04 12:03 PM
L55	952	A47B61/00.cpc. AND spring	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/04 12:03 PM
L56	24	("10244861"|"20180213929"|"9326598"|"9681746"|"8931750"|"7246784"|"10114352"|"5957426"|"5722513"|"4640488"|"5251864"|"4448386"|"4702454"|"2843418"|"9668572"|"20070001077"|"4753419"|"11083282"|"20170196351"|"D854775"|"20160249737"|"20120188302"|"10575630").PN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/02/04 12:03 PM
L57	39	("2156148" | "3245366" | "4691888" | "5588377" | "8544391" | "9326598" | "9480332" | "9504316" | "20040040480" | "20080203865" | "20130139736" | "20140041554" | "20150216296" | "20150289641" | "20160286951" | "20160338486").pn. OR ("9681746").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/02/04 12:03 PM
L58	24	("2531856" | "3727245" | "4611823" | "5447319" | "5722513" | "6974185" | "8016305" | "8544391" | "9326598" | "20040040480").pn. OR ("9480332").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/02/04 12:03 PM
L59	55	("3410328" | "4032103"	(US-PGPUB; USPAT;	OR	ON	ON	2022/02/04

		| "4405116" | "4558648" | "4577821" | "4753419" | "5192053" | "5299906" | "5605056" | "5722513" | "5771816" | "5833198" | "5957426" | "6056459" | "6269965" | "6336627" | "6427607" | "6705238" | "7048236").pn. OR ("7246784").urpn. AND (PGPB | USPT | USOC).dbnm.	USOCR)				12:03 PM
L60	109	("20040040480"|"9055810"|"8671853"|"20090200437"|"6722618"|"9554644"|"1318564"|"20130145972"|"4843978"|"6269753"|"9326598"|"5626323"|"9504316"|"20030213415"|"20140144352"|"20040035332"|"20090090832"|"4577821"|"8132518"|"9480332"|"20070080564"|"5829948").PN.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/04 12:03 PM
L61	23	("20040040480"|"9055810"|"8671853"|"20090200437"|"6722618"|"9554644"|"1318564"|"20130145972"|"4843978"|"6269753"|"9326598"|"5626323"|"9504316"|"20030213415"|"20140144352"|"20040035332"|"20090090832"|"4577821"|"8132518"|"9480332"|"20070080564"|"5829948").PN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/02/04 12:03 PM
L62	20	"10292510"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/04 12:03 PM
L63	26	"11160367"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/07 08:20 AM
L64	38	(Artificial Intelligence) More like doc:	(US-PGPUB; USPAT; USOCR; FIT (AU, AP,	OR	ON	ON	2022/02/07 08:20 AM

		US-11160367-B1 Text: (US-10575630-B1 OR US-10568416-B1 OR US-11140977-B1 OR GB-2575456-A OR US-10244861-B1 OR US-11134773-B1 OR US-20130014674-A1 OR US-11147366-B1 OR US-20200245756-A1 OR CN-109700183-A OR US-5588377-A OR US-20130014675-A1 OR US-11134774-B1 OR US-20200015584-A1 OR US-9326598-B1 OR EP-3593671-A1 OR US-10893748-B1 OR EP-3593671-B1 OR ES-2430597-T3 OR US-8303062-B2).did.	AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L65	53	"9815672"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/07 08:34 AM
L66	81	"4577821"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/07 09:33 AM
L67	11	("D845037"|"10258148"|"20140144352"|"8931750"|"10517390"|"10499730"|"11134774"|"20170354245"|"9815672"|"11160367"|"11134773"). PN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/02/07 09:42 AM
L68	120	("1318564" | "2937003" | "3295800" | "3826457" | "4221280" | "4449262" | "4549720" | "4558648" | "4577821" | "4702454" | "4741512" | "4753419" | "4843978" | "D302893" | "4941641" | "4967672" | "4995130" | "5037163" | "5211367" | "5251864" | "5257767" | "5294087"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/02/07 09:43 AM

		| "5400720" | "5588377" | "5626323" | "5765797" | "5829948" | "5926876" | "5957426" | "6076785" | "6098961" | "6269753" | "6516478" | "6533229" | "6533479" | "6672430" | "6701853" | "6702372" | "6722618" | "6742768" | "6792876" | "7048236" | "7204193" | "7207629" | "7575205" | "7677518" | "7841570" | "7845665" | "7950338" | "8015638" | "8132518" | "8303062" | "8469152" | "8490933" | "8544391" | "8671853" | "8684339" | "8931750" | "8950343" | "9049923" | "9055810" | "9232855" | "9326598" | "9480332" | "9504316" | "9554644" | "9681746" | "9809136" | "9815672" | "9955780" | "9981571" | "9993068" | "10018298" | "10023355" | "D830739" | "10123613" | "D845037" | "10244861" | "10258148" | "10258149" | "10306977" | "D854775" | "10413055" | "10499730" | "10517390" | "10524565" | "10542817" | "10544019" | "10568416" | "10575630" | "D901959" | "10869549" | "10893748" | "20030213415" | "20050120922" | "20070080564" | "20070266912" | "20080000393" | "20090145336" | "20100242174" | "20110001033" | "20120097822" | "20120188302" | "20130193392" | "20140144352" | "20150216296" | "20150289641" | "20160338486" | "20160353880" |					

		"20170071332" | "20170174486" | "20170196351" | "20170354245" | "20180055214" | "20180177289" | "20200029685" | "20200107633").pn. OR ("11134774").urpn. AND (PGPB | USPT | USOC).dbnm.					
L69	20	("3282566" | "4273306" | "5400720" | "5632209" | "5649493" | "9326598" | "20130340655" | "20140360414" | "20150289641" | "20180055214").pn. OR ("10517390").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/02/07 09:45 AM
L70	65	("2015/0289641").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/02/07 09:46 AM
L71	34	("4061237" | "4249749" | "4288195" | "4504041" | "4613272" | "4979592" | "5018931" | "6394419" | "6431319" | "6679479" | "8015638" | "8469152" | "8888070" | "9422141" | "9463966" | "9540220" | "20030075657" | "20050042068" | "20110262261" | "20140014886" | "20140027693" | "20150028787" | "20150298949").pn. OR ("9815672").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/02/07 09:52 AM
L72	27	("1954558" | "3110476" | "4526346" | "4573663" | "4659066" | "4741512").pn. OR ("D302893").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/02/07 09:59 AM
L73	34	("1327103" | "3096059" | "3116910" | "3645488" | "4558648" | "4659052").pn. OR ("4741512").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/02/07 10:09 AM

L74	0	WO9117906	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/07 10:41 AM
L75	21	"9117906"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/07 10:42 AM
L76	8	108/116.ccls. AND keyboard	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/02/07 10:45 AM
L77	38	108/115-120.ccls. AND keyboard	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/02/07 10:46 AM
L78	116	A47B9/16.cpc. AND keyboard	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/02/07 10:46 AM
L79	14	("2019/0110588").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/02/07 10:47 AM
L80	4303	scissor AND (table OR desk) AND keyboard	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/02/07 11:37 AM
L81	46	scissor SAME (table OR desk) SAME keyboard	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/02/07 11:38 AM
L82	23	("20040040480"|"9055810"|"8671853"|"20090200437"|"6722618"|"9554644"|"1318564"|"20130145972"|"4843978"|"6269753"|"9326598"|"5626323"|"9504316"|"20030213415"|"20140144352"|"20040035332"|"20090090832"|"4577821"|"8132518"|"9480332"|"20070080564"|"5829948").PN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/02/07 11:40 AM
L83	69	("226053" | "4403680" | "4515086" | "4926760" | "5632209" | "5829948" | "6038986" | "6112858" | "6286812" | "6397763" | "6585214" | "6679479" | "6705238" | "6857493" | "7677518" | "7950338" | "8015638" | "8424883" | "8469152" | "9055810" | "9133976" | "20040040480" |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/02/07 11:42 AM

		"20070034125" | "20130145972" | "20150289641").pn. OR ("9504316").urpn. AND (PGPB | USPT | USOC).dbnm.					
L84	77	("226053" | "588519" | "644247" | "780829" | "1244520" | "1824822" | "2406436" | "2630359" | "2913122" | "3474743" | "3494306" | "4194452" | "4515086" | "4624657" | "4625657" | "5048784" | "5092652" | "5174223" | "5176351" | "5249533" | "5490466" | "5549052" | "5606917" | "5681034" | "5823120" | "6220660" | "6439657" | "6907829" | "7140306" | "7201108" | "7654208" | "7677518" | "7690317" | "7887014" | "20040094072" | "20050039643" | "20070163475" | "20080203865" | "20110155023" | "20110247532" | "20130139736").pn. OR ("9055810").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/02/07 11:45 AM
L85	33	("2641247" | "4032103" | "4249749" | "4685731" | "6701853" | "7677518" | "7849789" | "8015638" | "8544391" | "9049923" | "9055810" | "9326598" | "20130139736" | "20150250303" | "20160249737").pn. OR ("9615655").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/02/07 11:46 AM
L86	12	("2016/0249737").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/02/07 11:47 AM
L87	134	"7677518"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/07 11:58 AM

L88	6	("20170202099" OR "6398325" OR "6407912" OR "6824174" OR "6918274" OR "7614672").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/02/16 05:59 PM
L89	182	("1136498" | "2703431" | "2710214" | "2720772" | "2780485" | "2871048" | "2874986" | "3012805" | "3151375" | "3367698" | "3488984" | "3743336" | "3782141" | "3896698" | "3957225" | "4038718" | "4105234" | "4116027" | "4138869" | "4184705" | "4224650" | "4307906" | "4321812" | "4335595" | "4365832" | "4366686" | "4379579" | "4394548" | "4416478" | "4428608" | "4436329" | "4466680" | "4494626" | "4531769" | "4548572" | "4554807" | "4580818" | "4595228" | "4618118" | "4632493" | "4633348" | "4635454" | "4683736" | "4704882" | "4707006" | "4813143" | "4817979" | "4828299" | "4881699" | "4892338" | "4892342" | "4925246" | "4931602" | "4938520" | "4942757" | "4961286" | "4967478" | "4975673" | "4995652" | "5031942" | "5048877" | "5066247" | "5183235" | "5189575" | "5201557" | "5219354" | "5226834" | "5285338" | "5355604" | "5364282" | "5375894" | "5410899" | "5413391" | "5419167" | "5433159" | "5443224" | "5443354" | "5454485" | "5457295" | "5488661" | "5526567" | "5553675" | "5555995" | "5558527" | "5575163" | "5593220" | "5607324" | "5619398" | "5620213" | "5653525" | "5727675" | "5740012" | "5743606" | "5779171" | "5788219" | "5803515" | "5820175" | "5882816" | "5893478" | "5897147" | "5901415" | "5901838" | "5915441" | "5918956"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/02/16 06:00 PM

		| "5938248" | "5941730" | "5956821" | "5971801" | "5974842" | "5979691" | "D417603" | "D418043" | "5997115" | "D419053" | "6036509" | "RE36672" | "6053586" | "6054798" | "D424405" | "D425396" | "D425775" | "6129429" | "6145352" | "6152497" | "6152533" | "6157532" | "6158787" | "6163913" | "6167076" | "6174007" | "6179350" | "6203076" | "6203077" | "6222736" | "6266239" | "6273532" | "6296334" | "6324386" | "6354638" | "6354680" | "6362975" | "6367896" | "6381145" | "6398325" | "6407912" | "6450554" | "6457788" | "6497437" | "6523870" | "6616201" | "6637785" | "6643139" | "6658739" | "6679533" | "6721183" | "6798669" | "6824174" | "6917518" | "6957979" | "20010026070" | "20020117864" | "20020163201" | "20020182896" | "20040021325" | "20060103141").pn. OR ("7614672").urpn. AND (PGPB | USPT | USOC).dbnm.					
L90	18	("3591219" | "4071722" | "4536022" | "5125697" | "5172520" | "5219195" | "5593192" | "5751545" | "6000250" | "6373692").pn. OR ("6616201").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/02/16 06:01 PM
L91	33	(Artificial Intelligence) More like doc: US-7325846-B2 Text: (CN-1537347-A OR EP-1392942-A4 OR EP-1392942-A2 OR US-20020182896-A1 OR US-6957979-B2 OR TW-538184-B OR US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO,	OR	ON	ON	2022/02/16 06:02 PM

		20110157779-A1 OR US-8270173-B2 OR US-5997323-A OR US-20080061563-A1 OR US-20040222647-A1 OR US-7614672-B2 OR US-20160168886-A1 OR US-9609767-B2 OR US-20170202099-A1 OR US-6272005-B1 OR US-7338096-B2 OR US-20060281358-A1 OR CN-210442737-U OR US-9207721-B2).did.	NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L92	14	("5010426" | "5325263" | "5975735" | "6483710" | "6929338" | "7325846" | "7782611" | "7843698" | "20070252393" | "20070253993").pn. OR ("9207721").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/02/16 06:02 PM
L93	23	("5671274" | "5721669" | "5769710" | "5924780" | "6381146" | "6398327" | "6929338" | "6947280" | "6952341" | "7242589" | "7379303" | "20010022758" | "20050173276").pn. OR ("7843698").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/02/16 06:03 PM
L94	35	(Artificial Intelligence) More like doc: US-9207721-B2 Text: (US-20130026893-A1 OR US-8540327-B2 OR US-5325263-A OR CN-213920886-U OR US-10813245-B2 OR US-20200060042-A1 OR CN-112277826-A OR US-9609767-B2 OR TW-202010376-A OR TW-I658769-B OR CN-110837283-B OR CN-110837283-A OR US-20050017608-A1 OR US-20110234068-A1 OR CN-101556489-B OR TW-I450269-B OR CN-101556489-A OR US-6398325-B1 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/16 06:04 PM

		CN-103163970-A OR US-20090255099-A1).did.					
L95	12	("5010426" | "5325263" | "5975735" | "6483710" | "6929338" | "7325846" | "7782611" | "7843698" | "20070107923" | "20070252393" | "20070253993" | "20110127895").pn. OR ("9609767").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/02/16 06:05 PM
L96	194	("1136498" | "2703431" | "2710214" | "2720772" | "2780485" | "2871048" | "2874986" | "3012805" | "3151375" | "3367698" | "3488984" | "3743336" | "3782141" | "3896698" | "3957225" | "4038718" | "4105234" | "4116027" | "4138869" | "4184705" | "4224650" | "4307906" | "4321812" | "4335595" | "4365832" | "4366686" | "4379579" | "4394548" | "4416478" | "4428608" | "4436329" | "4466680" | "4494626" | "4531769" | "4548572" | "4554807" | "4580818" | "4595228" | "4618118" | "4632493" | "4633348" | "4635454" | "4683736" | "4704882" | "4707006" | "4813143" | "4817979" | "4828299" | "4881699" | "4892338" | "4892342" | "4925246" | "4931602" | "4938520" | "4942757" | "4961286" | "4967478" | "4975673" | "4995652" | "5031942" | "5048877" | "5066247" | "5183235" | "5189575" | "5201557" | "5219354" | "5226834" | "5285338" | "5355604" | "5364282" | "5375894" | "5410899" | "5413391" | "5419167" | "5433159" | "5443224" | "5443354" | "5454485" | "5457295" | "5488661" | "5526567" | "5553675" | "5555995" | "5558527" | "5575163" | "5593220"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/02/16 06:09 PM

		| "5607324" | "5619398" | "5620213" | "5653525" | "5727675" | "5740012" | "5743606" | "5779171" | "5788219" | "5803515" | "5820175" | "5882816" | "5893478" | "5897147" | "5901415" | "5901838" | "5915441" | "5918956" | "5938248" | "5941730" | "5956821" | "5971801" | "5974842" | "5979691" | "D417603" | "D418043" | "5997115" | "D419053" | "6036509" | "RE36672" | "6053586" | "6054798" | "D424405" | "D425396" | "D425775" | "6129429" | "6145352" | "6152497" | "6152533" | "6157532" | "6158787" | "6163913" | "6167076" | "6174007" | "6179350" | "6203076" | "6203077" | "6222736" | "6266239" | "6273532" | "6296334" | "6324386" | "6354638" | "6354680" | "6362975" | "6367896" | "6381145" | "6398325" | "6407912" | "6450554" | "6457788" | "6497437" | "6523870" | "6616201" | "6637785" | "6643139" | "6658739" | "6679533" | "6721183" | "6798669" | "6824174" | "6917518" | "6957979" | "20010026070" | "20020117864" | "20020163201" | "20020182896" | "20040021325" | "20060103141").pn. OR ("7325846").urpn. AND (PGPB | USPT | USOC).dbnm.				
L97	13299	E05Y2900/606.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2022/02/17 07:11 AM
L98	2258	E05Y2900/606.cpc. AND (lock OR latch)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP,	OR	ON	ON	2022/02/17 07:11 AM

			AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L99	2	("20160029872" OR "20190032269").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/05/10 03:12 PM
L100	139	("0200057" OR "0606845" OR "0835247" OR "1217772" OR "2692807" OR "3444830" OR "4072288" OR "4433759" OR "4558648" OR "9113703" OR "20180125227" OR "10018298" OR "10023355" OR "10123613" OR "10258148" OR "10258149" OR "10264877" OR "10306977" OR "10413055" OR "10499730" OR "10517390" OR "10524565" OR "10542817" OR "10544019" OR "10568416" OR "10869549" OR "10893748" OR "11134774" OR "11140977" OR "11147366" OR "11160367" OR "1318564" OR "20030042380" OR "20050120922" OR "20070080564" OR "20070266912" OR "20080000393" OR "20090145336" OR "20100242174" OR "20120097822" OR "20130193392" OR "20140144352" OR "20150028787" OR "20150216296" OR "20150289641" OR "20160338486" OR "20160353880" OR "20170071332" OR "20170354245" OR	(US-PGPUB; USPAT)	OR	ON	ON	2022/09/12 09:49 AM

		"20180177289" OR "20180279770" OR "20190110588" OR "20190183239" OR "20190269237" OR "20200029685" OR "20200107633" OR "2937003" OR "3295800" OR "3823915" OR "3826457" OR "4221280" OR "4449262" OR "4549720" OR "4577821" OR "4625657" OR "4659052" OR "4709972" OR "4717112" OR "4741512" OR "4826123" OR "4843978" OR "4941641" OR "4967672" OR "4995130" OR "5037163" OR "5048784" OR "5211367" OR "5257767" OR "5294087" OR "5400720" OR "5588377" OR "5626323" OR "5765797" OR "5829948" OR "5836562" OR "5926876" OR "6076785" OR "6098961" OR "6148739" OR "6176456" OR "6179261" OR "6269753" OR "6273382" OR "6488248" OR "6516478" OR "6533229" OR "6533479" OR "6672430" OR "6701853" OR "6702372" OR "6722618" OR "6742768" OR "6792876" OR "6938866" OR "7048236" OR "7188813" OR "7204193" OR					

		"7207629" OR "7575205" OR "7677518" OR "7841570" OR "7845665" OR "7946551" OR "7950338" OR "8015638" OR "8132518" OR "8303062" OR "8469152" OR "8490933" OR "8544391" OR "8671853" OR "8684339" OR "8950343" OR "9049923" OR "9055810" OR "9232855" OR "9480332" OR "9504316" OR "9554644" OR "9809136" OR "9854904" OR "9955780" OR "9981571" OR "9993068" OR "D302893" OR "D830739" OR "D845037" OR "D870490" OR "D901959").pn.					
L101	16	("1217772"|"0200057"|"2692807"|"3444830"|"4072288"|"4433759"|"4558648"|"0606845"|"0835247"|"9113703").PN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/12 10:11 AM
L102	58	144/$.ccls. AND stool	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/12 11:31 AM
L103	198	206/$.ccls. AND stool	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/12 11:35 AM
L104	53	206/$.ccls. AND stool AND tool	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/09/12 11:35 AM
L105	5	("D318386" | "D474624" | "D520267" | "20030213415" | "20110094422").pn. OR ("D660618").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 08:28 AM
L106	22	("D111519" | "D232289" | "D236927" | "D239902" | "4099472" | "D275535" | "D303879" | "5217125" | "5400719" | "D362136" |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 08:28 AM

		"D499278").pn. OR ("D520267").urpn. AND (PGPB | USPT | USOC).dbnm.					
L107	37	("2003/0213415").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 08:29 AM
L108	20	(Artificial Intelligence) More like doc: US-D660618-S Text: (US-D611467-S OR US-D618017-S OR US-D593086-S OR US-D584154-S OR US-D619873-S OR US-D619874-S OR US-D584728-S OR US-D641024-S OR US-D605192-S OR US-D567237-S OR US-D605698-S OR US-D618208-S OR US-D543209-S OR US-D573827-S OR US-D546201-S OR US-D577257-S OR US-D592019-S OR US-D636091-S OR US-D682562-S OR US-D616702-S).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 08:30 AM
L109	39	(Artificial Intelligence) More like doc: US-20030213415-A1 Text: (US-6158357-A OR US-6099093-A OR US-5660450-A OR US-20040065235-A1 OR JP-3060999-U OR US-6182579-B1 OR CA-2221914-C OR US-6398326-B1 OR US-5967631-A OR US-9629463-B1 OR US-20070169673-A1 OR US-7469644-B2 OR US-5357873-A OR DE-29915673-U1 OR US-20050211863-A1 OR US-6220180-B1 OR CA-2313994-A1 OR US-20020108539-A1 OR CA-2221914-A1 OR AU-2015247798-A1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 08:31 AM

L110	34	(Artificial Intelligence) More like doc: US-20050211863-A1 Text: (AU-668523-B2 OR US-5294087-A OR US-20050105255-A1 OR JP-4343957-B2 OR EP-0610327-A1 OR US-7113393-B2 OR WO-9308426-A1 OR EP-0610327-A4 OR CA-2121344-A1 OR EP-1725136-A1 OR WO-2005051124-A1 OR EP-1725136-B1 OR JP-2007511323-A OR KR-20060097732-A OR EP-1535537-A2 OR US-4901972-A OR JP-2005519356-A OR EP-1423030-A1 OR EP-1423030-B1 OR CA-1216054-A).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 08:31 AM
L111	33	(Artificial Intelligence) More like doc: US-20050105255-A1 Text: (US-20050103960-A1 OR US-6938866-B2 OR US-7113393-B2 OR EP-1725136-A1 OR WO-2005051124-A1 OR EP-1725136-B1 OR KR-20060097732-A OR JP-2007511323-A OR JP-4343957-B2 OR JP-4095025-B2 OR WO-03022099-A1 OR EP-1423030-A1 OR KR-20040034693-A OR EP-1423030-B1 OR EP-1535537-A2 OR JP-2005519356-A OR JP-20070511323-A5 OR US-20030042380-A1 OR US-6536728-B1 OR KR-100893636-B1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 08:32 AM
L112	37	("2003/0213415").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 08:34 AM
L113	5	("D311802" | "D407234" | "D436470" | "D442389").pn. OR ("D474624").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 08:34 AM

L114	14	("D118484" | "D241490" | "D311650" | "D323437" | "D394965" | "D407234").pn. OR ("D442389").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 08:34 AM
L115	16	("D118484").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 08:36 AM
L116	51260	monitor WITH stand	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 08:43 AM
L117	1892	monitor WITH stand AND A47B	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 08:43 AM
L118	11	monitor WITH stand SAME four WITH legs AND A47B	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 08:43 AM
L119	36	(Artificial Intelligence) More like doc: US-6220558-B1 Text: (US-5733025-A OR US-5020768-A OR US-5263668-A OR US-5295648-A OR US-5397081-A OR EP-0595824-A4 OR WO-9219128-A2 OR US-5685441-A OR US-6049454-A OR US-20150359327-A1 OR TW-M242989-U OR US-7969732-B1 OR US-7839626-B2 OR US-20100128425-A1 OR US-11140979-B2 OR US-20210037663-A1 OR US-20100001148-A1 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 08:45 AM

		US-20020003197-A1 OR US-6474614-B2 OR US-5553824-A).did.					
L120	41	"6672430"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 09:53 AM
L121	78	"3048537"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 04:01 PM
L122	4	"20180320437"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 04:02 PM
L123	29	"105124920"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 05:50 PM
L124	36	("10159336"|"11388989"|"11388991"|"11395544"|"11464325"|"20040035332"|"20040040480"|"20050029849"|"20090090832"|"20090146389"|"20090200437"|"20110001033"|"20110024958"|"20130145972"|"20130199420"|"20140158026"|"20150232005"|"20150274038"|"20150368082"|"20150375896"|"20160051042"|"20160060084"|"20160106205"|"20160170402"|"20160258573"|"20160260019"|"20160309889"|"20170174486"|"20170360192"|"20180008037"|"20180055214"|"20180103755	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:32 PM

		2"|"20180255919"|"201 80360208"|"3092918"). PN.					
L125	212	("10159336"|"11388989 "|"11388991"|"1139554 4"|"11464325"|"200400 35332"|"20040040480"| "20050029849"|"20090 090832"|"20090146389 "|"20090200437"|"2011 0001033"|"2011002495 8"|"20130145972"|"201 30199420"|"201401580 26"|"20150232005"|"20 150274038"|"20150368 082"|"20150375896"|"2 0160051042"|"2016006 0084"|"20160106205"|" 20160170402"|"201602 58573"|"20160260019"| "20160309889"|"20170 174486"|"20170360192 "|"20180008037"|"2018 0055214"|"2018010375 2"|"20180255919"|"201 80360208"|"3092918"|" 0200057"|"0606845"|"0 835247"|"1217772"|"26 92807"|"3444830"|"407 2288"|"4433759"|"4558 648"|"9113703"|"20180 125227"|"6857493"|"10 018298"|"10023355"|"1 0114352"|"10123613"|" 10244861"|"10258148"| "10258149"|"10264877" |"10306977"|"10413055 "|"10499730"|"1051739 0"|"10524565"|"105428 17"|"10544019"|"10568 416"|"10575630"|"1086 9549"|"10893748"|"110 83282"|"11134773"|"11 134774"|"11140977"|"1 1147366"|"11160367"|" 1318564"|"2003004238 0"|"20030213415"|"200 50120922"|"200700010 77"|"20070080564"|"20 070266912"|"20080000 393"|"20090145336"|"2 0100242174"|"2012009 7822"|"20120188302"|" 20130193392"|"201401 44352"|"20150028787"| "20150216296"|"20150 289641"|"20160249737 "|"20160338486"|"2016	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:35 PM

		0353880"|"2017007133 2"|"20170196351"|"201 70354245"|"201801772 89"|"20180213929"|"20 180279770"|"20190110 588"|"20190183239"|"2 0190269237"|"2020002 9685"|"20200107633"|" 2843418"|"2937003"|"3 295800"|"3823915"|"38 26457"|"4221280"|"444 8386"|"4449262"|"4549 720"|"4577821"|"46256 57"|"4640488"|"465905 2"|"4702454"|"4709972" |"4717112"|"4741512"|" 4753419"|"4826123"|"4 843978"|"4941641"|"49 67672"|"4995130"|"503 7163"|"5048784"|"5211 367"|"5251864"|"52577 67"|"5294087"|"540072 0"|"5588377"|"5626323" |"5722513"|"5765797"|" 5829948"|"5836562"|"5 926876"|"5957426"|"60 76785"|"6098961"|"614 8739"|"6176456"|"6179 261"|"6269753"|"62733 82"|"6488248"|"651647 8"|"6533229"|"6533479" |"6672430"|"6701853"|" 6702372"|"6722618"|"6 742768"|"6792876"|"69 38866"|"7048236"|"718 8813"|"7204193"|"7207 629"|"7246784"|"75752 05"|"7677518"|"784157 0"|"7845665"|"7946551" |"7950338"|"8015638"|" 8132518"|"8303062"|"8 469152"|"8490933"|"85 44391"|"8671853"|"868 4339"|"8931750"|"8950 343"|"9049923"|"90558 10"|"9232855"|"932659 8"|"9480332"|"9504316" |"9554644"|"9668572"|" 9681746"|"9809136"|"9 815672"|"9854904"|"99 55780"|"9981571"|"999 3068"|"D302893"|"D830 739"|"D845037"|"D8547 75"|"D870490"|"D90195 9").PN.				
L126	894	A47B1/03.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD,	OR	ON	ON	2023/01/24 07:43 PM

			DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L127	18385	A47B21/0314,00,02,03.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L128	4938	A47B21/0314.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L129	1192	A47B21/0314.cpc. AND spring	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L130	39	(Artificial Intelligence) More like doc: US-11160367-B1 Text: (US-11464325-B1 OR US-11134773-B1 OR US-11470959-B1 OR US-10575630-B1 OR US-11388989-B1 OR US-10244861-B1 OR US-11147366-B1 OR US-11134774-B1 OR US-11140977-B1 OR US-10568416-B1 OR US-10893748-B1 OR US-11388991-B1 OR US-11395544-B1 OR CA-2860970-C OR AU-2020200160-B2 OR US-20130014674-A1 OR US-20160037909-A1 OR US-20140238279-A1 OR US-11382419-B2 OR US-10869549-B2).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L131	40	(Artificial Intelligence) More like doc:	(US-PGPUB; USPAT; USOCR; FIT (AU, AP,	OR	ON	ON	2023/01/24 07:43 PM

		US-11134774-B1 Text: (US-11134773-B1 OR US-11470959-B1 OR US-11388989-B1 OR US-11160367-B1 OR US-11464325-B1 OR US-10575630-B1 OR US-10244861-B1 OR US-11147366-B1 OR US-11140977-B1 OR US-10568416-B1 OR US-10893748-B1 OR US-11388991-B1 OR US-11395544-B1 OR CA-2860970-C OR US-20180177289-A1 OR US-20130014674-A1 OR CN-108024625-B OR US-20160037909-A1 OR US-20220257006-A1 OR US-20210052067-A1).did.	AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L132	58	(Artificial Intelligence) More like doc: CN-107744256-A Text: (CN-107744256-B OR CN-108968333-A OR CN-108260926-A OR CN-107041626-A OR CN-107713327-A OR CN-209235181-U OR CN-107041626-B OR CN-209547376-U OR CN-110840078-A OR CN-107485168-A OR CN-108771320-A OR CN-110141042-A OR CN-109077456-A OR CN-107157193-A OR CN-107928125-A OR CN-108283365-A OR CN-205358710-U OR CN-209235239-U OR CN-108741658-A OR CN-208403593-U).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L133	14739	A47B21/00,02,03.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L134	3083	A47B21/00,02,03.cpc.	(US-PGPUB; USPAT;	OR	ON	ON	2023/01/24

		AND spring	USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				07:43 PM
L135	2620	A47B9/16.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L136	2124	A47B2021/0321,0364.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L137	72	("1318564" | "2937003" | "3295800" | "4221280" | "4558648" | "4577821" | "4843978" | "5588377" | "5626323" | "5829948" | "5957426" | "6098961" | "6269753" | "6516478" | "6533479" | "6722618" | "6742768" | "8132518" | "8671853" | "9049923" | "9055810" | "9326598" | "9480332" | "9504316" | "9554644" | "20030213415" | "20040035332" | "20040040480" | "20070080564" | "20080000393" | "20090090832" | "20090200437" | "20110001033" | "20110024958" | "20120097822" | "20130145972" | "20130193392" | "20140144352" | "20150232005" | "20150375896" | "20160338486" | "20170174486" | "20180008037").pn. OR ("10244861").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM

L138	1313	312/208.1,223.3.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L139	1602	248/421,562,588,585,431,432,439.ccls. AND spring	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L140	2342	108/147,144.11,145.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L141	2629	108/93,96,116-118,120.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L142	2515	108/43,138,50.01,50.02.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L143	3703	A47B3/02,0809,0815.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L144	1128	A47B3/02,0809,0815.cpc. AND spring	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM

L145	605	A47B2003/025.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L146	518	Poniatowski.in.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L147	30	("4448386"|"9668572"|"7841570"|"8684339"|"20120188302"|"8671853"|"9504316"|"10244861"|"2843418"|"5722513"|"9326598"|"8544391"|"9480332"|"9554644"|"4941641"|"5251864"|"5957426"|"7246784"|"9681746"|"9049923"|"4640488"|"4753419"|"9326598"|"10114352"|"8931750"|"20070001077"|"20180213929"|"4702454"|"7950338"|"8132518").PN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L148	544	A47B3/00.cpc. AND spring	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L149	1120	A47B61/00.cpc. AND spring	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L150	24	("10244861"|"20180213929"|"9326598"|"9681746"|"8931750"|"7246784"|"10114352"|"5957426"|"5722513"|"4640488"|"5251864"|"4448386"|"4702454"|"2843418"|"9668572"|"20070001077	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM

		"|"4753419"|"11083282"|"20170196351"|"D854775"|"20160249737"|"20120188302"|"10575630").PN.					
L151	44	("2156148" | "3245366" | "4691888" | "5588377" | "8544391" | "9326598" | "9480332" | "9504316" | "20040040480" | "20080203865" | "20130139736" | "20140041554" | "20150216296" | "20150289641" | "20160286951" | "20160338486").pn. OR ("9681746").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L152	29	("2531856" | "3727245" | "4611823" | "5447319" | "5722513" | "6974185" | "8016305" | "8544391" | "9326598" | "20040040480").pn. OR ("9480332").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L153	63	("3410328" | "4032103" | "4405116" | "4558648" | "4577821" | "4753419" | "5192053" | "5299906" | "5605056" | "5722513" | "5771816" | "5833198" | "5957426" | "6056459" | "6269965" | "6336627" | "6427607" | "6705238" | "7048236").pn. OR ("7246784").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L154	109	("20040040480"|"9055810"|"8671853"|"20090200437"|"6722618"|"9554644"|"1318564"|"20130145972"|"4843978"|"6269753"|"9326598"|"5626323"|"9504316"|"20030213415"|"20140144352"|"20040035332"|"20090090832"|"4577821"|"8132518"|"9480332"|"20070080564"|"5829948").PN.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L155	23	("20040040480"|"90558	(US-PGPUB; USPAT;	OR	ON	ON	2023/01/24

		10"|"8671853"|"20090200437"|"6722618"|"9554644"|"1318564"|"20130145972"|"4843978"|"6269753"|"9326598"|"5626323"|"9504316"|"20030213415"|"20140144352"|"20040035332"|"20090090832"|"4577821"|"8132518"|"9480332"|"20070080564"|"5829948").PN.	USOCR)				07:43 PM
L156	22	"10292510"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L157	894	A47B1/03.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L158	18385	A47B21/0314,00,02,03.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L159	4938	A47B21/0314.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L160	1192	A47B21/0314.cpc. AND spring	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L161	39	(Artificial Intelligence) More like doc: US-11160367-B1 Text:	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU,	OR	ON	ON	2023/01/24 07:43 PM

		(US-11464325-B1 OR US-11134773-B1 OR US-11470959-B1 OR US-10575630-B1 OR US-11388989-B1 OR US-10244861-B1 OR US-11147366-B1 OR US-11134774-B1 OR US-11140977-B1 OR US-10568416-B1 OR US-10893748-B1 OR US-11388991-B1 OR US-11395544-B1 OR CA-2860970-C OR AU-2020200160-B2 OR US-20130014674-A1 OR US-20160037909-A1 OR US-20140238279-A1 OR US-11382419-B2 OR US-10869549-B2).did.	CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L162	40	(Artificial Intelligence) More like doc: US-11134774-B1 Text: (US-11134773-B1 OR US-11470959-B1 OR US-11388989-B1 OR US-11160367-B1 OR US-11464325-B1 OR US-10575630-B1 OR US-10244861-B1 OR US-11147366-B1 OR US-11140977-B1 OR US-10568416-B1 OR US-10893748-B1 OR US-11388991-B1 OR US-11395544-B1 OR CA-2860970-C OR US-20180177289-A1 OR US-20130014674-A1 OR CN-108024625-B OR US-20160037909-A1 OR US-20220257006-A1 OR US-20210052067-A1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L163	58	(Artificial Intelligence) More like doc: CN-107744256-A Text: (CN-107744256-B OR CN-108968333-A OR CN-108260926-A OR CN-107041626-A OR CN-107713327-A OR CN-209235181-U OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO,	OR	ON	ON	2023/01/24 07:43 PM

		CN-107041626-B OR CN-209547376-U OR CN-110840078-A OR CN-107485168-A OR CN-108771320-A OR CN-110141042-A OR CN-109077456-A OR CN-107157193-A OR CN-107928125-A OR CN-108283365-A OR CN-205358710-U OR CN-209235239-U OR CN-108741658-A OR CN-208403593-U).did.	NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L164	14739	A47B21/00,02,03.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L165	3083	A47B21/00,02,03.cpc. AND spring	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L166	2620	A47B9/16.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L167	2124	A47B2021/0321,0364.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L168	72	("1318564" | "2937003" | "3295800" | "4221280" | "4558648" | "4577821" | "4843978" | "5588377" | "5626323" | "5829948" | "5957426" | "6098961" | "6269753" | "6516478" | "6533479" | "6722618" | "6742768" | "8132518" | "8671853" | "9049923"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM

		| "9055810" | "9326598" | "9480332" | "9504316" | "9554644" | "20030213415" | "20040035332" | "20040040480" | "20070080564" | "20080000393" | "20090090832" | "20090200437" | "20110001033" | "20110024958" | "20120097822" | "20130145972" | "20130193392" | "20140144352" | "20150232005" | "20150375896" | "20160338486" | "20170174486" | "20180008037").pn. OR ("10244861").urpn. AND (PGPB | USPT | USOC).dbnm.					
L169	1313	312/208.1,223.3.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L170	1602	248/421,562,588,585,431,432,439.ccls. AND spring	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L171	2342	108/147,144.11,145.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L172	2629	108/93,96,116-118,120.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM

L173	2515	108/43,138,50.01,50.02.ccls.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L174	3703	A47B3/02,0809,0815.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L175	1128	A47B3/02,0809,0815.cpc. AND spring	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L176	605	A47B2003/025.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L177	518	Poniatowski.in.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L178	30	("4448386"|"9668572"|"7841570"|"8684339"|"20120188302"|"8671853"|"9504316"|"10244861"|"2843418"|"5722513"|"9326598"|"8544391"|"9480332"|"9554644"|"4941641"|"5251864"|"5957426"|"7246784"|"9681746"|"9049923"|"4640488"|"4753419"|"9326598"|"10114352"|"8931750"|"8931750"|"20070001077"|"20180213929"|"4702454"|"7950338"|"8132518").PN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM

L179	544	A47B3/00.cpc. AND spring	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L180	1120	A47B61/00.cpc. AND spring	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L181	24	("10244861"|"20180213929"|"9326598"|"9681746"|"8931750"|"7246784"|"10114352"|"5957426"|"5722513"|"4640488"|"5251864"|"4448386"|"4702454"|"2843418"|"9668572"|"20070001077"|"4753419"|"11083282"|"20170196351"|"D854775"|"20160249737"|"20120188302"|"10575630").PN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L182	44	("2156148" | "3245366" | "4691888" | "5588377" | "8544391" | "9326598" | "9480332" | "9504316" | "20040040480" | "20080203865" | "20130139736" | "20140041554" | "20150216296" | "20150289641" | "20160286951" | "20160338486").pn. OR ("9681746").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L183	29	("2531856" | "3727245" | "4611823" | "5447319" | "5722513" | "6974185" | "8016305" | "8544391" | "9326598" | "20040040480").pn. OR ("9480332").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L184	63	("3410328" | "4032103" | "4405116" | "4558648" | "4577821" | "4753419"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM

		| "5192053" | "5299906" | "5605056" | "5722513" | "5771816" | "5833198" | "5957426" | "6056459" | "6269965" | "6336627" | "6427607" | "6705238" | "7048236").pn. OR ("7246784").urpn. AND (PGPB | USPT | USOC).dbnm.					
L185	109	("20040040480"|"9055810"|"8671853"|"20090200437"|"6722618"|"9554644"|"1318564"|"20130145972"|"4843978"|"6269753"|"9326598"|"5626323"|"9504316"|"20030213415"|"20140144352"|"20040035332"|"20090090832"|"4577821"|"8132518"|"9480332"|"20070080564"|"5829948").PN.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L186	23	("20040040480"|"9055810"|"8671853"|"20090200437"|"6722618"|"9554644"|"1318564"|"20130145972"|"4843978"|"6269753"|"9326598"|"5626323"|"9504316"|"20030213415"|"20140144352"|"20040035332"|"20090090832"|"4577821"|"8132518"|"9480332"|"20070080564"|"5829948").PN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L187	22	"10292510"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L188	38	"11160367"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L189	39	(Artificial Intelligence) More like doc: US-11160367-B1 Text:	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU,	OR	ON	ON	2023/01/24 07:43 PM

		(US-11464325-B1 OR US-11134773-B1 OR US-11470959-B1 OR US-10575630-B1 OR US-11388989-B1 OR US-10244861-B1 OR US-11147366-B1 OR US-11134774-B1 OR US-11140977-B1 OR US-10568416-B1 OR US-10893748-B1 OR US-11388991-B1 OR US-11395544-B1 OR CA-2860970-C OR AU-2020200160-B2 OR US-20130014674-A1 OR US-20160037909-A1 OR US-20140238279-A1 OR US-11382419-B2 OR US-10869549-B2).did.	CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L190	59	"9815672"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L191	86	"4577821"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L192	11	("D845037"|"10258148"|"20140144352"|"8931750"|"10517390"|"10499730"|"11134774"|"20170354245"|"9815672"|"11160367"|"11134773").PN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L193	126	("1318564" | "2937003" | "3295800" | "3826457" | "4221280" | "4449262" | "4549720" | "4558648" | "4577821" | "4702454" | "4741512" | "4753419" | "4843978" | "D302893" | "4941641" | "4967672" | "4995130" | "5037163" | "5211367" | "5251864" | "5257767" | "5294087" | "5400720" | "5588377" | "5626323" | "5765797"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM

		| "5829948" | "5926876" | "5957426" | "6076785" | "6098961" | "6269753" | "6516478" | "6533229" | "6533479" | "6672430" | "6701853" | "6702372" | "6722618" | "6742768" | "6792876" | "7048236" | "7204193" | "7207629" | "7575205" | "7677518" | "7841570" | "7845665" | "7950338" | "8015638" | "8132518" | "8303062" | "8469152" | "8490933" | "8544391" | "8671853" | "8684339" | "8931750" | "8950343" | "9049923" | "9055810" | "9232855" | "9326598" | "9480332" | "9504316" | "9554644" | "9681746" | "9809136" | "9815672" | "9955780" | "9981571" | "9993068" | "10018298" | "10023355" | "D830739" | "10123613" | "D845037" | "10244861" | "10258148" | "10258149" | "10306977" | "D854775" | "10413055" | "10499730" | "10517390" | "10524565" | "10542817" | "10544019" | "10568416" | "10575630" | "D901959" | "10869549" | "10893748" | "20030213415" | "20050120922" | "20070080564" | "20070266912" | "20080000393" | "20090145336" | "20100242174" | "20110001033" | "20120097822" | "20120188302" | "20130193392" | "20140144352" | "20150216296" | "20150289641" | "20160338486" | "20160353880" | "20170071332" | "20170174486" |				

		"20170196351" | "20170354245" | "20180055214" | "20180177289" | "20200029685" | "20200107633").pn. OR ("11134774").urpn. AND (PGPB | USPT | USOC).dbnm.					
L194	27	("3282566" | "4273306" | "5400720" | "5632209" | "5649493" | "9326598" | "20130340655" | "20140360414" | "20150289641" | "20180055214").pn. OR ("10517390").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L195	73	("2015/0289641").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L196	39	("4061237" | "4249749" | "4288195" | "4504041" | "4613272" | "4979592" | "5018931" | "6394419" | "6431319" | "6679479" | "8015638" | "8469152" | "8888070" | "9422141" | "9463966" | "9540220" | "20030075657" | "20050042068" | "20110262261" | "20140014886" | "20140027693" | "20150028787" | "20150298949").pn. OR ("9815672").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L197	32	("1954558" | "3110476" | "4526346" | "4573663" | "4659066" | "4741512").pn. OR ("D302893").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L198	39	("1327103" | "3096059" | "3116910" | "3645488" | "4558648" | "4659052").pn. OR ("4741512").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L199	0	WO9117906	(US-PGPUB; USPAT; USOCR; FIT (AU, AP,	OR	ON	ON	2023/01/24 07:43 PM

			AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L200	22	"9117906"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L201	8	108/116.ccls. AND keyboard	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L202	38	108/115-120.ccls. AND keyboard	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L203	139	A47B9/16.cpc. AND keyboard	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L204	24	("2019/0110588").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L205	4799	scissor AND (table OR desk) AND keyboard	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L206	50	scissor SAME (table OR desk) SAME keyboard	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L207	23	("20040040480"|"9055810"|"8671853"|"20090200437"|"6722618"|"9554644"|"1318564"|"20130145972"|"4843978"|"6269753"|"9326598"|"5626323"|"9504316"|"20030213415"|"20140144352"|"20040035332"|"20090090832"|"4577821"|"8132518"|"9480332"|"20070080564"|"5829948").PN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L208	78	("226053" | "4403680" | "4515086" | "4926760" | "5632209" | "5829948" | "6038986" | "6112858" | "6286812" | "6397763" | "6585214" | "6679479" | "6705238" | "6857493" | "7677518" | "7950338" | "8015638" | "8424883" | "8469152" | "9055810" | "9133976" | "20040040480" | "20070034125" | "20130145972" |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM

		"20150289641").pn. OR ("9504316").urpn. AND (PGPB | USPT | USOC).dbnm.					
L209	82	("226053" | "588519" | "644247" | "780829" | "1244520" | "1824822" | "2406436" | "2630359" | "2913122" | "3474743" | "3494306" | "4194452" | "4515086" | "4624657" | "4625657" | "5048784" | "5092652" | "5174223" | "5176351" | "5249533" | "5490466" | "5549052" | "5606917" | "5681034" | "5823120" | "6220660" | "6439657" | "6907829" | "7140306" | "7201108" | "7654208" | "7677518" | "7690317" | "7887014" | "20040094072" | "20050039643" | "20070163475" | "20080203865" | "20110155023" | "20110247532" | "20130139736").pn. OR ("9055810").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L210	34	("2641247" | "4032103" | "4249749" | "4685731" | "6701853" | "7677518" | "7849789" | "8015638" | "8544391" | "9049923" | "9055810" | "9326598" | "20130139736" | "20150250303" | "20160249737").pn. OR ("9615655").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L211	20	("2016/0249737").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L212	143	"7677518"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L213	6	("20170202099" OR "6398325" OR	(US-PGPUB; USPAT)	OR	ON	ON	2023/01/24 07:43 PM

		"6407912" OR "6824174" OR "6918274" OR "7614672").pn.					
L214	183	("1136498" | "2703431" | "2710214" | "2720772" | "2780485" | "2871048" | "2874986" | "3012805" | "3151375" | "3367698" | "3488984" | "3743336" | "3782141" | "3896698" | "3957225" | "4038718" | "4105234" | "4116027" | "4138869" | "4184705" | "4224650" | "4307906" | "4321812" | "4335595" | "4365832" | "4366686" | "4379579" | "4394548" | "4416478" | "4428608" | "4436329" | "4466680" | "4494626" | "4531769" | "4548572" | "4554807" | "4580818" | "4595228" | "4618118" | "4632493" | "4633348" | "4635454" | "4683736" | "4704882" | "4707006" | "4813143" | "4817979" | "4828299" | "4881699" | "4892338" | "4892342" | "4925246" | "4931602" | "4938520" | "4942757" | "4961286" | "4967478" | "4975673" | "4995652" | "5031942" | "5048877" | "5066247" | "5183235" | "5189575" | "5201557" | "5219354" | "5226834" | "5285338" | "5355604" | "5364282" | "5375894" | "5410899" | "5413391" | "5419167" | "5433159" | "5443224" | "5443354" | "5454485" | "5457295" | "5488661" | "5526567" | "5553675" | "5555995" | "5558527" | "5575163" | "5593220" | "5607324" | "5619398" | "5620213" | "5653525" | "5727675" | "5740012" | "5743606" | "5779171" | "5788219" | "5803515" | "5820175" | "5882816" | "5893478" | "5897147" | "5901415" | "5901838" | "5915441" | "5918956" | "5938248" | "5941730" | "5956821" | "5971801"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM

		| "5974842" | "5979691" | "D417603" | "D418043" | "5997115" | "D419053" | "6036509" | "RE36672" | "6053586" | "6054798" | "D424405" | "D425396" | "D425775" | "6129429" | "6145352" | "6152497" | "6152533" | "6157532" | "6158787" | "6163913" | "6167076" | "6174007" | "6179350" | "6203076" | "6203077" | "6222736" | "6266239" | "6273532" | "6296334" | "6324386" | "6354638" | "6354680" | "6362975" | "6367896" | "6381145" | "6398325" | "6407912" | "6450554" | "6457788" | "6497437" | "6523870" | "6616201" | "6637785" | "6643139" | "6658739" | "6679533" | "6721183" | "6798669" | "6824174" | "6917518" | "6957979" | "20010026070" | "20020117864" | "20020163201" | "20020182896" | "20040021325" | "20060103141").pn. OR ("7614672").urpn. AND (PGPB | USPT | USOC).dbnm.				
L215	20	("3591219" | "4071722" | "4536022" | "5125697" | "5172520" | "5219195" | "5593192" | "5751545" | "6000250" | "6373692").pn. OR ("6616201").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L216	32	(Artificial Intelligence) More like doc: US-7325846-B2 Text: (US-20040222647-A1 OR US-20080061563-A1 OR US-7614672-B2 OR US-7201407-B2 OR US-20050023838-A1 OR US-10619386-B2 OR US-9207721-B2 OR US-9609767-B2 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK,	OR	ON	ON	2023/01/24 07:43 PM

		TW-I595825-B OR US-20160198580-A1 OR TW-201725955-A OR US-20170191292-A1 OR CN-106954355-B OR US-20110127895-A1 OR WO-2010014108-A2 OR CN-106954355-A OR US-20170202099-A1 OR US-6296334-B1 OR US-7338096-B2 OR US-20060281358-A1).did.	TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L217	16	("5010426" | "5325263" | "5975735" | "6483710" | "6929338" | "7325846" | "7782611" | "7843698" | "20070252393" | "20070253993").pn. OR ("9207721").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L218	25	("5671274" | "5721669" | "5769710" | "5924780" | "6381146" | "6398327" | "6929338" | "6947280" | "6952341" | "7242589" | "7379303" | "20010022758" | "20050173276").pn. OR ("7843698").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L219	31	(Artificial Intelligence) More like doc: US-9207721-B2 Text: (US-9609767-B2 OR US-20110127895-A1 OR WO-2010014108-A2 OR US-20160198580-A1 OR TW-I450269-B OR TW-201009824-A OR WO-2010014108-A3 OR US-7614672-B2 OR US-6398325-B1 OR CN-113685083-B OR CN-113685083-A OR TW-I742691-B OR TW-202145854-A OR US-20050017608-A1 OR US-20090255099-A1 OR US-6918274-B2 OR TW-202010376-A OR TW-202145853-A OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM

		TW-I770517-B OR TW-I658769-B).did.					
L220	12	("5010426" | "5325263" | "5975735" | "6483710" | "6929338" | "7325846" | "7782611" | "7843698" | "20070107923" | "20070252393" | "20070253993" | "20110127895").pn. OR ("9609767").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L221	196	("1136498" | "2703431" | "2710214" | "2720772" | "2780485" | "2871048" | "2874986" | "3012805" | "3151375" | "3367698" | "3488984" | "3743336" | "3782141" | "3896698" | "3957225" | "4038718" | "4105234" | "4116027" | "4138869" | "4184705" | "4224650" | "4307906" | "4321812" | "4335595" | "4365832" | "4366686" | "4379579" | "4394548" | "4416478" | "4428608" | "4436329" | "4466680" | "4494626" | "4531769" | "4548572" | "4554807" | "4580818" | "4595228" | "4618118" | "4632493" | "4633348" | "4635454" | "4683736" | "4704882" | "4707006" | "4813143" | "4817979" | "4828299" | "4881699" | "4892338" | "4892342" | "4925246" | "4931602" | "4938520" | "4942757" | "4961286" | "4967478" | "4975673" | "4995652" | "5031942" | "5048877" | "5066247" | "5183235" | "5189575" | "5201557" | "5219354" | "5226834" | "5285338" | "5355604" | "5364282" | "5375894" | "5410899" | "5413391" | "5419167" | "5433159" | "5443224" | "5443354" | "5454485" | "5457295" | "5488661" | "5526567" | "5553675" | "5555995" | "5558527" | "5575163" | "5593220" | "5607324" | "5619398"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM

		| "5620213" | "5653525" | "5727675" | "5740012" | "5743606" | "5779171" | "5788219" | "5803515" | "5820175" | "5882816" | "5893478" | "5897147" | "5901415" | "5901838" | "5915441" | "5918956" | "5938248" | "5941730" | "5956821" | "5971801" | "5974842" | "5979691" | "D417603" | "D418043" | "5997115" | "D419053" | "6036509" | "RE36672" | "6053586" | "6054798" | "D424405" | "D425396" | "D425775" | "6129429" | "6145352" | "6152497" | "6152533" | "6157532" | "6158787" | "6163913" | "6167076" | "6174007" | "6179350" | "6203076" | "6203077" | "6222736" | "6266239" | "6273532" | "6296334" | "6324386" | "6354638" | "6354680" | "6362975" | "6367896" | "6381145" | "6398325" | "6407912" | "6450554" | "6457788" | "6497437" | "6523870" | "6616201" | "6637785" | "6643139" | "6658739" | "6679533" | "6721183" | "6798669" | "6824174" | "6917518" | "6957979" | "20010026070" | "20020117864" | "20020163201" | "20020182896" | "20040021325" | "20060103141").pn. OR ("7325846").urpn. AND (PGPB | USPT | USOC).dbnm.				
L222	14229	E05Y2900/606.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L223	2404	E05Y2900/606.cpc. AND (lock OR latch)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD,	OR	ON	ON	2023/01/24 07:43 PM

			DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L224	2	("20160029872" OR "20190032269").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2023/01/24 07:43 PM
L225	139	("0200057" OR "0606845" OR "0835247" OR "1217772" OR "2692807" OR "3444830" OR "4072288" OR "4433759" OR "4558648" OR "9113703" OR "20180125227" OR "10018298" OR "10023355" OR "10123613" OR "10258148" OR "10258149" OR "10264877" OR "10306977" OR "10413055" OR "10499730" OR "10517390" OR "10524565" OR "10542817" OR "10544019" OR "10568416" OR "10869549" OR "10893748" OR "11134774" OR "11140977" OR "11147366" OR "11160367" OR "1318564" OR "20030042380" OR "20050120922" OR "20070080564" OR "20070266912" OR "20080000393" OR "20090145336" OR "20100242174" OR "20120097822" OR "20130193392" OR "20140144352" OR "20150028787" OR "20150216296" OR "20150289641" OR "20160338486" OR "20160353880" OR "20170071332" OR "20170354245" OR "20180177289" OR	(US-PGPUB; USPAT)	OR	ON	ON	2023/01/24 07:43 PM

		"20180279770" OR "20190110588" OR "20190183239" OR "20190269237" OR "20200029685" OR "20200107633" OR "2937003" OR "3295800" OR "3823915" OR "3826457" OR "4221280" OR "4449262" OR "4549720" OR "4577821" OR "4625657" OR "4659052" OR "4709972" OR "4717112" OR "4741512" OR "4826123" OR "4843978" OR "4941641" OR "4967672" OR "4995130" OR "5037163" OR "5048784" OR "5211367" OR "5257767" OR "5294087" OR "5400720" OR "5588377" OR "5626323" OR "5765797" OR "5829948" OR "5836562" OR "5926876" OR "6076785" OR "6098961" OR "6148739" OR "6176456" OR "6179261" OR "6269753" OR "6273382" OR "6488248" OR "6516478" OR "6533229" OR "6533479" OR "6672430" OR "6701853" OR "6702372" OR "6722618" OR "6742768" OR "6792876" OR "6938866" OR "7048236" OR "7188813" OR "7204193" OR "7207629" OR					

		"7575205" OR "7677518" OR "7841570" OR "7845665" OR "7946551" OR "7950338" OR "8015638" OR "8132518" OR "8303062" OR "8469152" OR "8490933" OR "8544391" OR "8671853" OR "8684339" OR "8950343" OR "9049923" OR "9055810" OR "9232855" OR "9480332" OR "9504316" OR "9554644" OR "9809136" OR "9854904" OR "9955780" OR "9981571" OR "9993068" OR "D302893" OR "D830739" OR "D845037" OR "D870490" OR "D901959").pn.					
L226	16	("1217772"|"0200057"|"2692807"|"3444830"|"4072288"|"4433759"|"4558648"|"0606845"|"0835247"|"9113703").PN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L227	58	144/$.ccls. AND stool	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L228	198	206/$.ccls. AND stool	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L229	53	206/$.ccls. AND stool AND tool	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L230	5	("D318386" | "D474624" | "D520267" | "20030213415" | "20110094422").pn. OR ("D660618").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L231	22	("D111519" | "D232289" | "D236927" | "D239902" | "4099472" | "D275535" | "D303879" | "5217125" | "5400719" | "D362136" | "D499278").pn. OR	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM

		("D520267").urpn. AND (PGPB | USPT | USOC).dbnm.					
L232	37	("2003/0213415").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L233	20	(Artificial Intelligence) More like doc: US-D660618-S Text: (US-D611467-S OR US-D618017-S OR US-D593086-S OR US-D584154-S OR US-D619873-S OR US-D619874-S OR US-D584728-S OR US-D641024-S OR US-D605192-S OR US-D567237-S OR US-D605698-S OR US-D618208-S OR US-D543209-S OR US-D573827-S OR US-D546201-S OR US-D577257-S OR US-D592019-S OR US-D636091-S OR US-D682562-S OR US-D616702-S).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L234	39	(Artificial Intelligence) More like doc: US-20030213415-A1 Text: (US-6158357-A OR US-6099093-A OR US-5660450-A OR US-20040065235-A1 OR JP-3060999-U OR US-6182579-B1 OR CA-2221914-C OR US-6398326-B1 OR US-5967631-A OR US-9629463-B1 OR US-20070169673-A1 OR US-7469644-B2 OR US-5357873-A OR DE-29915673-U1 OR US-20050211863-A1 OR US-6220180-B1 OR CA-2313994-A1 OR US-20020108539-A1 OR CA-2221914-A1 OR AU-2015247798-A1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L235	34	(Artificial Intelligence)	(US-PGPUB; USPAT;	OR	ON	ON	2023/01/24

		More like doc: US-20050211863-A1 Text: (AU-668523-B2 OR US-5294087-A OR US-20050105255-A1 OR JP-4343957-B2 OR EP-0610327-A1 OR US-7113393-B2 OR WO-9308426-A1 OR EP-0610327-A4 OR CA-2121344-A1 OR EP-1725136-A1 OR WO-2005051124-A1 OR EP-1725136-B1 OR JP-2007511323-A OR KR-20060097732-A OR EP-1535537-A2 OR US-4901972-A OR JP-2005519356-A OR EP-1423030-A1 OR EP-1423030-B1 OR CA-1216054-A).did.	USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				07:43 PM
L236	33	(Artificial Intelligence) More like doc: US-20050105255-A1 Text: (US-20050103960-A1 OR US-6938866-B2 OR US-7113393-B2 OR EP-1725136-A1 OR WO-2005051124-A1 OR EP-1725136-B1 OR KR-20060097732-A OR JP-2007511323-A OR JP-4343957-B2 OR JP-4095025-B2 OR WO-03022099-A1 OR EP-1423030-A1 OR KR-20040034693-A OR EP-1423030-B1 OR EP-1535537-A2 OR JP-2005519356-A OR JP-20070511323-A5 OR US-20030042380-A1 OR US-6536728-B1 OR KR-100893636-B1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L237	37	("2003/0213415").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L238	5	("D311802" | "D407234" | "D436470" | "D442389").pn. OR ("D474624").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM

L239	14	("D118484" | "D241490" | "D311650" | "D323437" | "D394965" | "D407234").pn. OR ("D442389").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L240	16	("D118484").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM
L241	51260	monitor WITH stand	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L242	1892	monitor WITH stand AND A47B	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L243	11	monitor WITH stand SAME four WITH legs AND A47B	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L244	36	(Artificial Intelligence) More like doc: US-6220558-B1 Text: (US-5733025-A OR US-5020768-A OR US-5263668-A OR US-5295648-A OR US-5397081-A OR EP-0595824-A4 OR WO-9219128-A2 OR US-5685441-A OR US-6049454-A OR US-20150359327-A1 OR TW-M242989-U OR US-7969732-B1 OR US-7839626-B2 OR US-20100128425-A1 OR US-11140979-B2 OR US-20210037663-A1 OR US-20100001148-A1 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM

		US-20020003197-A1 OR US-6474614-B2 OR US-5553824-A).did.					
L245	41	"6672430"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L246	78	"3048537"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L247	4	"20180320437"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L248	29	"105124920"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:43 PM
L249	36	("10159336"|"11388989"|"11388991"|"11395544"|"11464325"|"20040035332"|"20040040480"|"20050029849"|"20090090832"|"20090146389"|"20090200437"|"20110001033"|"20110024958"|"20130145972"|"20130199420"|"20140158026"|"20150232005"|"20150274038"|"20150368082"|"20150375896"|"20160051042"|"20160060084"|"20160106205"|"20160170402"|"20160258573"|"20160260019"|"20160309889"|"20170174486"|"20170360192"|"20180008037"|"20180055214"|"20180103755	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM

		2"|"20180255919"|"201 80360208"|"3092918"). PN.					
L250	212	("10159336"|"11388989 "|"11388991"|"1139554 4"|"11464325"|"200400 35332"|"20040040480"| "20050029849"|"20090 090832"|"20090146389 "|"20090200437"|"2011 0001033"|"2011002495 8"|"20130145972"|"201 30199420"|"201401580 26"|"20150232005"|"20 150274038"|"20150368 082"|"20150375896"|"2 0160051042"|"2016006 0084"|"20160106205"|" 20160170402"|"201602 58573"|"20160260019"| "20160309889"|"20170 174486"|"20170360192 "|"20180008037"|"2018 0055214"|"2018010375 2"|"20180255919"|"201 80360208"|"3092918"|" 0200057"|"0606845"|"0 835247"|"1217772"|"26 92807"|"3444830"|"407 2288"|"4433759"|"4558 648"|"9113703"|"20180 125227"|"6857493"|"10 018298"|"10023355"|"1 0114352"|"10123613"|" 10244861"|"10258148"| "10258149"|"10264877" |"10306977"|"10413055 "|"10499730"|"1051739 0"|"10524565"|"105428 17"|"10544019"|"10568 416"|"10575630"|"1086 9549"|"10893748"|"110 83282"|"11134773"|"11 134774"|"11140977"|"1 1147366"|"11160367"|" 1318564"|"2003004238 0"|"20030213415"|"200 50120922"|"200700010 77"|"20070080564"|"20 070266912"|"20080000 393"|"20090145336"|"2 0100242174"|"2012009 7822"|"20120188302"|" 20130193392"|"201401 44352"|"20150028787"| "20150216296"|"20150 289641"|"20160249737 "|"20160338486"|"2016	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:43 PM

		0353880"|"2017007133 2"|"20170196351"|"201 70354245"|"201801772 89"|"20180213929"|"20 180279770"|"20190110 588"|"20190183239"|"2 0190269237"|"2020002 9685"|"20200107633"|" 2843418"|"2937003"|"3 295800"|"3823915"|"38 26457"|"4221280"|"444 8386"|"4449262"|"4549 720"|"4577821"|"46256 57"|"4640488"|"465905 2"|"4702454"|"4709972" |"4717112"|"4741512"|" 4753419"|"4826123"|"4 843978"|"4941641"|"49 67672"|"4995130"|"503 7163"|"5048784"|"5211 367"|"5251864"|"52577 67"|"5294087"|"540072 0"|"5588377"|"5626323" |"5722513"|"5765797"|" 5829948"|"5836562"|"5 926876"|"5957426"|"60 76785"|"6098961"|"614 8739"|"6176456"|"6179 261"|"6269753"|"62733 82"|"6488248"|"651647 8"|"6533229"|"6533479" |"6672430"|"6701853"|" 6702372"|"6722618"|"6 742768"|"6792876"|"69 38866"|"7048236"|"718 8813"|"7204193"|"7207 629"|"7246784"|"75752 05"|"7677518"|"784157 0"|"7845665"|"7946551" |"7950338"|"8015638"|" 8132518"|"8303062"|"8 469152"|"8490933"|"85 44391"|"8671853"|"868 4339"|"8931750"|"8950 343"|"9049923"|"90558 10"|"9232855"|"932659 8"|"9480332"|"9504316" |"9554644"|"9668572"|" 9681746"|"9809136"|"9 815672"|"9854904"|"99 55780"|"9981571"|"999 3068"|"D302893"|"D830 739"|"D845037"|"D8547 75"|"D870490"|"D90195 9").PN.				
L251	39	(Artificial Intelligence) More like doc: US-11160367-B1	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY,	OR	ON	ON	2023/01/24 07:53 PM

		Text: (US-11464325-B1 OR US-11134773-B1 OR US-11470959-B1 OR US-10575630-B1 OR US-11388989-B1 OR US-10244861-B1 OR US-11147366-B1 OR US-11134774-B1 OR US-11140977-B1 OR US-10568416-B1 OR US-10893748-B1 OR US-11388991-B1 OR US-11395544-B1 OR CA-2860970-C OR AU-2020200160-B2 OR US-20130014674-A1 OR US-20160037909-A1 OR US-20140238279-A1 OR US-11382419-B2 OR US-10869549-B2).did.	CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L252	0	("2021/0259405").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/24 07:56 PM
L253	42	(Artificial Intelligence) More like doc: US-20210259405-A1 Text: (DE-102018222308-B4 OR DE-102018222308-A1 OR WO-2020126187-A1 OR DE-102020132036-A1 OR KR-101375876-B1 OR US-20020117589-A1 OR US-6488244-B2 OR WO-02054911-A1 OR US-20020088915-A1 OR NL-1020851-C2 OR NL-1004271-C1 OR EP-3834660-A1 OR KR-200330839-Y1 OR US-10709236-B2 OR US-20060065163-A1 OR KR-20080026452-A OR EP-1377189-A1 OR US-11369193-B2 OR WO-02082948-A1 OR KR-20220108230-A).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/24 07:56 PM
L254	23	"3861524"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO;	OR	ON	ON	2023/01/25 08:08 AM

			JPO; DERWENT; IBM_TDB)				
L255	29	"105124920"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/25 08:57 AM
L256	41	"6672430"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/25 10:14 AM
L257	5	"111058714"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/25 08:48 PM
L258	35	"10304701"	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/25 09:32 PM
L259	2514	108/115-120.ccls.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/26 11:25 AM
L260	530	108/43,138,50.01,50.02 .ccls. AND spring	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/26 12:07 PM
L261	946	108/147,144.11,145.ccl s. AND (spring OR wheel)	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/26 12:21 PM
L262	50	("2829863" | "2937852" | "3110476" | "3282566" | "3404791" | "4157743"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/26 12:34 PM

		| "4526346" | "4558648" | "4712653" | "4741512" | "4979592" | "5695173" | "5722513" | "6516478").pn. OR ("6672430").urpn. AND (PGPB | USPT | USOC).dbnm.					
L263	27	("3219338" | "4558648" | "4741512" | "5400720" | "5695173" | "5823120" | "6672430" | "9326598" | "9504316" | "9815672" | "20030154890" | "20050120922" | "20130341984" | "20170174486" | "20170340104").pn. OR ("10258149").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/26 12:35 PM
L264	39	("1327103" | "3096059" | "3116910" | "3645488" | "4558648" | "4659052").pn. OR ("4741512").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/26 12:36 PM
L265	18	("3891108" | "4221280" | "4447042" | "4573663" | "4741512" | "5024141" | "5058286" | "5322143" | "5695173" | "5967494" | "6189432" | "6241049" | "6729032" | "20070119658" | "20100243973").pn. OR ("8262064").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/26 12:36 PM
L266	90	108/50.01,50.02.ccls. AND box SAME support	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/26 12:56 PM
L267	124	312/194-196,223.3.ccls. AND box SAME support	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/01/26 01:01 PM

L268	24	("0688104" | "D157076" | "2903316" | "4870630" | "4905609").pn. OR ("7641294").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/26 01:02 PM
L269	28	("1010801" | "1812694" | "1869649" | "2022591" | "2103552" | "2380379" | "2526767" | "2772130" | "2943243" | "3969006" | "4056295" | "4454732" | "6032912" | "7306300" | "7641294" | "7712493" | "D632900" | "20090236956").pn. OR ("8485614").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/26 01:03 PM
L270	27	("Re32668" | "1336973" | "1377824" | "1609945" | "2801145" | "3533584" | "4062302" | "4265501" | "4530548" | "5016545" | "5213220" | "5315936" | "5382087" | "5692714" | "5706959").pn. OR ("6032912").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/26 01:04 PM
L271	30	("D206999" | "4243197" | "D274878" | "D289864" | "D313099" | "D334184" | "D340446" | "D395117" | "6032912" | "D430218" | "D446052" | "D459049").pn. OR ("D466725").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/26 01:05 PM
L272	39	("0498974" | "2604369" | "2615776" | "3285685" | "3717395" | "4491375" | "4496200" | "4570793" | "4582285" | "4657214" | "4709972" | "4931978" | "5122941" | "5161870" | "5205631" | "5213401" | "5265735").pn. OR ("5588727").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/26 01:08 PM
L273	25	("2613623" | "3003839" | "3098686" | "3730604" | "4090756" | "4944402"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/26 01:09 PM

		| "5058849" | "5114007" | "5147120" | "5433518" | "5466058" | "5588727" | "5692815" | "5729430" | "5738423" | "5944596").pn. OR ("6595607").urpn. AND (PGPB | USPT | USOC).dbnm.					
L274	63	("D143426" | "D269749" | "D283323" | "D288157" | "D290612" | "D290706" | "D291204" | "D293530" | "D312630" | "D313133" | "D316709" | "D317760" | "D319822" | "D330892" | "D331045" | "D336088" | "D349107" | "D355647" | "D357910" | "D362246" | "D363621" | "D367387" | "2386092" | "2605159" | "3858528" | "4345803" | "4483572" | "4624510" | "4709972" | "4717112" | "4852830" | "4863124" | "5062609" | "5265952" | "5290099" | "5408939" | "5437235" | "5587876" | "5604663").pn. OR ("5729430").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/01/26 01:10 PM

PE2E SEARCH - Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
N1	2543	(A47B9/16 OR A47B21/02 OR A47B21/0314 OR A47B21/04 OR A47B2021/0335).cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2023/01/24 07:47 PM
N2	106	A47B1/03.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2023/01/24 07:54 PM
N3	2862	A47B21/0314,00,02,03.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2023/01/24 07:54 PM
N4	923	A47B21/00,03.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2023/01/24 07:55 PM

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/493,830	Poniatowski, Nathan Mark
	Examiner	Art Unit
	JANET M WILKENS	3637

CPC - Searched*		
Symbol	**Date**	**Examiner**
A47B1/03; 21/0314,00,02,03,04	09/26/2022	JMW
A47B9/16; 2021/0321,0364,0335	09/26/2022	JMW
A47B3/00; 61/00	09/26/2022	JMW
A47B3/02,0809,0815; 2003/025	09/26/2022	JMW
updated search	01/25/2023	JMW

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**
312	208.1,223.3	09/26/2022	JMW
248	421,562,588, 585,431 ,432,439	09/26/2022	JMW
108	147,144.11,145,93, 96,116-118,120.43, 138,50.01,50.02,28	09/26/2022	JMW
updated search		01/25/2023	JMW

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	**Date**	**Examiner**
updated search from parent cases	09/26/2022	JMW
updated search	01/25/2023	JMW

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/493,830	Poniatowski, Nathan Mark
	Examiner	Art Unit
	JANET M WILKENS	3637

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

Notice of References Cited	Application/Control No. 17/493,830	Applicant(s)/Patent Under Reexamination Poniatowski, Nathan Mark	
	Examiner JANET M WILKENS	Art Unit 3637	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	317468	05-1885	Morstatt		
*	B	US-6220558-B1	04-2001	Broder; Damon W.	F16M11/22	248/346.02
*	C	US-6381335-B2	04-2002	Juszkiewicz; Henry E.	H04R1/02	381/388
*	D	US-5729430-A	03-1998	Johnson; Joni Kay	F16M13/025	312/208.3
*	E	US-5588727-A	12-1996	D'Agaro; Amos	A47B21/0314	312/301
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/493,830	10/04/2021	Nathan Mark Poniatowski	1001-001US13	4682

155431 7590 02/01/2023

Lund IP
1125 2nd Ave
Newport, MN 55055

EXAMINER	
WILKENS, JANET MARIE	

ART UNIT	PAPER NUMBER
3637	

NOTIFICATION DATE	DELIVERY MODE
02/01/2023	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

eofficeaction@appcoll.com
info@lundip.com

Office Action Summary	Application No. 17/493,830	Applicant(s) Poniatowski, Nathan Mark	
	Examiner JANET M WILKENS	Art Unit 3637	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on December 29, 2022.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☑ This action is **FINAL.** 2b) ☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-4,6-19 and 21-32 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☑ Claim(s) 10-11,14,25-26 and 28 is/are allowed.

7) ☑ Claim(s) 1-4,6-9,12-13,15-19,23-24,27,29-30 and 32 is/are rejected.

8) ☑ Claim(s) 21-22 and 31 is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☑ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date 12/29/2022.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Terminal Disclaimer

The terminal disclaimer filed on December 29, 2022 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of 10,575,630; 11,464,325; and 11,134,773 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 6-8, 12, 13 and 32 are rejected under 35 U.S.C. 103 as being unpatentable over Morstatt (317,468) in view of Broder et al (6,220,558) and Richards (4,221,280). Morstatt teaches desktop workspace (Fig. 2; column 1, line 42, table reference) that adjusts vertically, comprising: a work surface platform (B); a base (A) configured to sit on an existing platform (the floor); and a height adjustment mechanism connecting the work surface platform and the base, the height adjustment mechanism including: a set of pivot arms (C,C') that connect at a scissoring pivot point creating a

scissoring motion when raising and lowering the work surface platform to various heights; a base pivot point (a) fixed relative to the base and connecting the base and the set of pivot arms; a platform pivot point (a') fixed relative to the work surface platform and connecting the work surface platform and the set of pivot arms; a sliding mechanism (E with c) on an end of an arm of the set of pivot arms between the end of the arm and either the work surface platform or the base; and a spring (F) that assists in elevation of the work surface platform by applying a force to one of the set of pivot arms as part of the scissoring motion (if the spring is extended to help balance the platform upon lowering, it will inherently be compressed to assist in lifting the platform). Morstatt also teaches that the set of pivot arms is a first set of pivot arms, the desktop workspace further comprising: a second set of pivot arms (C,C', opposite side). For claim 1, Morstatt fails to teach an element sitting on the work surface platform, the element including an elevated platform surface above the work surface platform. Broder teaches an element (10) capable of sitting on a work surface platform, the element including an elevated platform surface (14) above the work surface platform in an office environment (column 1, lines 21-30). It would have been obvious to one having ordinary skill in the art before the effective filing date of the claimed invention to modify the workspace of Morstatt by adding the element of Broder on the platform, to provide an elevated monitor space therewith. Second, Morstatt in view of Broder fails to teach a crossbeam that connects the two sets of arms to one another. Richards teaches height adjustment mechanism including sets of pivots arms attached via a crossbeam (46c,48d). It would have been obvious to one having ordinary skill in the art before the effective filing date of the claimed invention to modify the workspace of Boucher in view of Broder by

adding a crossbeam(s), such as is taught by Richards, between the arms, to reinforce and strengthen the height adjustment mechanism and to allow the arm sets to concisely move together.

For claim 2, Morstatt in view of Broder and Richards further teaches that the element further includes four legs (16) that support the elevated platform surface above the work surface platform (Fig. 1 of Broder), each of the four legs being proximate to one of the four corners of the platform.

For claim 3, Morstatt in view of Broder and Richards further teaches that the element includes four sides including a bottom side (bottom surfaces of 16) on the work surface platform, a top side forming the elevated platform surface and two sidewalls (sides of 16) that support the elevated platform surface above the bottom side and the work surface platform (Fig. 1 of Broder).

For claim 4, Morstatt in view of Broder and Richards further teaches that there is a computer monitor (title and abstract of Broder) sitting on the elevated platform surface.

For claim 6, Morstatt in view of Broder and Richards further teaches that the spring extends between the work surface platform and the element that connects the first set of pivot arms to the second set of pivot arms (Fig. 2 of Morstatt with crossbeam of Richards which would be attached with the spring connectors on C; see Fig. 1 of Morstatt).

For claim 7, Morstatt in view of Broder and Richards further teaches that one end of the spring is fixed to the work surface platform (see Fig. 2 of Morstatt).

For claim 12, Morstatt in view of Broder and Richards further teaches that the sliding mechanism is a first sliding mechanism, the desktop workspace further comprising a second sliding mechanism(E' with c), wherein either the first sliding mechanism or the second sliding mechanism is attached or slides along the work surface platform, and the other of the first sliding mechanism and the second sliding mechanism is attached to or slides along the base (Fig. 2 of Morstatt).

For claim 13, Morstatt in view of Broder and Richards further teaches that the scissoring motion when raising and lowering the work surface platform to various heights of the height adjustment mechanism moves the work surface platform in a straight vertical direction relative to the base.

For claims 8 and 32, Morstatt in view of Broder and Richards further teaches that the spring is attached directly to one of the first set of pivot arms (via the pins on C; see Fig. 1 of Morstatt)

Claims 1-4, 8, 12, 13, 15-19, 23, 27, 29, and 30 are rejected under 35 U.S.C. 103 as being unpatentable over Boucher et al (6,672,430) in view of Broder et al (6,220,558) and Richards (4,221,280). Boucher teaches desktop workspace (Fig. 6) that adjusts vertically, comprising: a work surface platform (2); a base (16) configured to sit on an existing platform; and a height adjustment mechanism connecting the work surface platform and the base, the height adjustment mechanism including: a set of pivot arms (6,8) that connect at a scissoring pivot point creating a scissoring motion when raising and lowering the work surface platform to various heights; a base pivot point (18) fixed relative to the base and connecting the base and the set of pivot arms; a platform pivot point (12) fixed relative to the work surface platform and connecting the work surface

platform and the set of pivot arms; a sliding mechanism (14,20) on an end of an arm of the set of pivot arms between the end of the arm and either the work surface platform or the base; and a spring (122,222) that assists in elevation of the work surface platform by applying a force to one of the set of pivot arms as part of the scissoring motion. Boucher also teaches that the set of pivot arms is a first set of pivot arms, the desktop workspace further comprising: a second set of pivot arms (column 4, line 51). For claims 1 and 16, Boucher fails to teach an element sitting on the work surface platform, the element including an elevated platform surface above the work surface platform. Broder teaches an element (10) capable of sitting on a work surface platform, the element including an elevated platform surface (14) above the work surface platform in an office environment (column 1, lines 21-30). It would have been obvious to one having ordinary skill in the art before the effective filing date of the claimed invention to modify the workspace of Boucher by adding the element of Broder on the platform, to provide an elevated monitor space therewith. Second, Boucher fails to teach a crossbeam that connects the two sets of arms to one another. Richards teaches height adjustment mechanism including sets of pivots arms attached via a crossbeam (46c,48d). It would have been obvious to one having ordinary skill in the art before the effective filing date of the claimed invention to modify the workspace of Boucher in view of Broder by adding a crossbeam(s) between the arms, such as is taught by Richards, to reinforce and strengthen the height adjustment mechanism and to allow the arm sets to concisely move together.

For claims 2 and 17, Boucher in view of Broder and Richards further teaches that the element further includes four legs (16 of Broder) that support the elevated platform

surface above the work surface platform (Fig. 1 of Broder), each of the four legs being proximate to one of the four corners of the platform.

For claims 3 and 18, Boucher in view of Broder and Richards further teaches that the element includes four sides including a bottom side (bottom of 16) on the work surface platform, a top side forming the elevated platform surface and two sidewalls (sides of 16) that support the elevated platform surface above the bottom side and the work surface platform (Fig. 1 of Broder).

For claims 4 and 19, Boucher in view of Broder and Richards further teaches that there is a computer monitor (title and abstract of Broder) sitting on the elevated platform surface.

For claims 8 and 23, Boucher in view of Broder and Richards further teaches that the gas spring is attached directly to the one of the set of pivot arms (see Fig. 6 of Boucher).

For claim 12, Boucher in view of Broder and Richards further teaches that the sliding mechanism is a first sliding mechanism (14), the desktop workspace further comprising a second sliding mechanism (20), wherein either the first sliding mechanism or the second sliding mechanism is attached or slides along the work surface platform, and the other of the first sliding mechanism and the second sliding mechanism is attached to or slides along the base (Fig. 6 of Boucher).

For claims 13 and 27, Boucher in view of Ross further teaches that the scissoring motion when raising and lowering the work surface platform to various heights of the height adjustment mechanism moves the work surface platform in a straight vertical direction relative to the base/existing platform.

For claims 15 and 29, Boucher in view of Ross also teaches that the sliding mechanism includes a wheel (14,20) mounted on the end of the arm of the set of pivot arms.

For claim 16, Boucher in view of Broder and Richards also teaches that the height adjustment mechanism is configured raise and lower the work surface platform relative to an existing platform (column 1, lines 8-23 of Boucher wherein it is stated that the lift platform can be connected to a base, a floor or an operation deck of a printing press); bottom pivot (18) directly locatable the existing platform; and a second sliding mechanism (20) on an end of a second arm of the set of pivot arms between the end of the second arm and the existing platform. There is also a second set of pivot arms as part of height adjustment mechanism (column 4, lines 49-52 of Boucher).

For claim 30, Boucher in view of Broder and Richards also teaches that the wheel is a first wheel, wherein the second sliding mechanism includes a second wheel mounted on the end of the second arm.

Claims 9 and 24 are rejected under 35 U.S.C. 103 as being unpatentable over Boucher et al (6,672,430) in view of Broder et al (6,220,558) and Richards (4,221,280) as applied to claims 1-4, 8, 12, 13, 15-19, 23, 27, 29, and 30 above, and further in view of Baudermann (WO 2014/180572 with English translation in 9,815,672). As stated above, Boucher in view of Broder and Richards teaches the limitations of claims 1 and 16, including a spring attached between to the arms. For claims 9 and 24, Boucher in view of Broder and Richards fails to teach that the spring is attached directly to the arms' scissoring pivot point. Baudermann teaches attaching a gas spring (32) to a scissoring pivot point of a pair of arms (Fig. 3). It would have been obvious to one

having ordinary skill in the art before the effective filing date of the claimed invention to modify the workspace of Boucher in view of Broder and Richards by moving the arm attachment point of the gas spring to the pivot point, such as is taught by Baudermann, depending on the leverage point desired/required for the height adjustment mechanism.

Claim 9 is rejected under 35 U.S.C. 103 as being unpatentable over Morstatt (317,468) in view of Broder et al (6,220,558) and Richards (4,221,280) as applied to claims 1-4, 6-8, 12, 13 and 32 above, and further in view of Baudermann (WO 2014/180572 with English translation in 9,815,672). As stated above, Morstatt in view of Broder and Richards teaches the limitations of claim 1, including a spring attached between and to the arms. For claim 9, Morstatt in view of Broder and Richards fails to teach that the spring is attached directly to the arms' scissoring pivot point. Baudermann teaches attaching a gas spring (32) to a scissoring pivot point of a pair of arms (Fig. 3). It would have been obvious to one having ordinary skill in the art before the effective filing date of the claimed invention to modify the workspace of Morstatt in view of Broder and Richards by moving the arm attachment point of the gas spring to the pivot point, such as is taught by Baudermann, depending on the leverage point desired/required for the height adjustment mechanism.

Allowable Subject Matter

Claims 10, 11, 14, 25, 26 and 28 are allowed.

Claims 21, 22 and 31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments filed December 29, 2022 have been fully considered but they are not persuasive. Although the art rejections of claim sets 1+ and 16+ over the base reference of Li et al (CN105124920) have been overcome by removing the gas spring element limitation (not provided for in the provisional case), the examiner is now applying Morstatt (317,468) which teaches a spring, now called for in the claims, as the base reference. Broder et al (6,220,558) is being used as a secondary reference for its teaching of a monitor platform now with four legs being claimed, while the secondary reference of Richards (4,221,280) is being used for its crossbeam element. The motivations for these combinations being discussed above in the art rejections. Furthermore, the base reference of Boucher et al (6,672,430) is being applied to claim sets 1 + and 16+ which have been amended similar to claims 1 with 5 and 16 with 20, but now are broader in scope with a generic spring in place of the gas spring, changing the priority date. The secondary references of Broder and Richards providing the same features for the same purposes as with Morstatt. See art rejections above. Furthermore, the examiner contends that Boucher does teach both a base and existing platform. In column 1, lines 18-23 of Boucher, it is stated that the lift platform can be connected to a base, a floor or an operation deck of a printing press, satisfying both claim set situations.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JANET M WILKENS whose telephone number is 571-272-6869. The examiner can normally be reached Mon thru Thurs 7am-5:30pm EST.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel Troy can be reached on 571-270-3742. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is

available to registered users. To file and manage patent submissions in Patent Center, visit: https://patentcenter.uspto.gov. Visit https://www.uspto.gov/patents/apply/patent-center for more information about Patent Center and https://www.uspto.gov/patents/docx for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Wilkens
January 24, 2023

/JANET M WILKENS/
Primary Examiner, Art Unit 3637

Commonwealth of Australia
The Patents Act 1952

DECLARATION IN SUPPORT

In support of the (Convention) Application made by:

Hymo AB
Box 187
S-616 00 ÅBY Sweden
for a patent for an invention entitled:

Device at a hydraulic lifting table

I (We) I, Goran Kull, Managing Director
of and care of the applicant company do solemnly and sincerely declare as follows:

~~(a) I am (We are) authorised by the applicant(s) for the patent~~

b) I am (We are) authorised by the applicant(s) for the patent to make this declaration on its behalf.

Delete the following if not a Convention Application.

The basic application(s) as defined by section 141 (1A) of the Act was (were) made

in	Sweden	on 16 April 1985
in		on
in		on

by HYMO AB

The basic application(s) referred to in this paragraph is (are) the first application(s) made in a Convention country in respect of the invention the subject of the application.

~~(a) I am (We are) the actual inventor(s) of the invention~~

b) Lars Johansson, Perstorpsvagen 11, S-616 00 ABY Sweden

is (are) the actual inventor(s) of the invention and the facts upon which
the applicant company
is (are) entitled to make the application are as follows:

the applicant is a person who would if a patent were granted upon an application made by the actual inventor be entitled to have the patent assigned to it.

Declared at Åby this 8th day of September 19 87

Hymo AB
Signed Göran Kull Status Managing director

Declarant's Name

F. B. RICE & CO PATENT ATTORNEYS
This form is suitable for any type of Patent Application. No legalisation required.

(12) PATENT ABRIDGMENT (11) Document No. AU-B-57702/86
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 580874

(54) Title
DEVICE AT A HYDRAULIC LIFTING TABLE

(51)[4] International Patent Classification(s)
B66F 007/08 B66F 003/22

(21) Application No. : 57702/86 (22) Application Date : 09.04.86

(87) WIPO Number : WO86/06054

(30) Priority Data

(31) Number (32) Date (33) Country
8501852 16.04.85 SE SWEDEN

(43) Publication Date : 05.11.86

(44) Publication Date of Accepted Application : 02.02.89

(71) Applicant(s)
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LARS JOHANSSON

(74) Attorney or Agent
F.B. RICE & CO.

(56) Prior Art Documents
DE 2253765
GB 846161
DE 1207061

(57) Claim

1. Arrangement for a hydraulic lifting table of the scissor type with at least two pairs of scissor arms pivotally attached to one another, which scissor arms are attached at their ends to a lower frame section and an upper table section in such a way as to be capable of pivoting and rolling, and a centrally positioned power transmission arrangement pivotally attached to the frame section, so as to engage via rollers with guide curves, one of which is attached to the frame section, and the other is operatively connected to a pair of scissor arms, and which are moved towards and away from one another by means of the rollers for the purpose of raising the lifting table and vice versa, characterized in that the table section has the form of a plain symmetrical 'E', in which the 3 cross-pieces of the 'E'-shape cover the pairs of scissor arms and the power transmission arrangement, in that the guide curves are centrally positioned, i.e. in the vicinity of the ~~hydraulic cylinder~~ power transmission arrangement, and in that the

operative connection consists of a shaft pivotally mounted in the frame section, which shaft constitutes the operative connection between the guide curve and the pair of scissor arms.

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International Bureau

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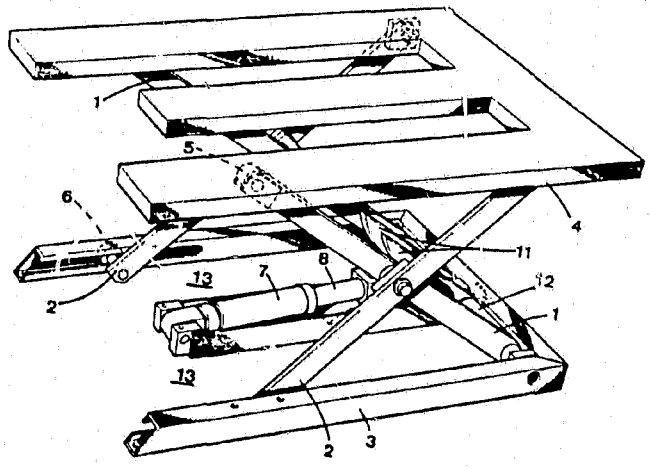
AUSTRALIAN
- 5 NOV 1986
PATENT OFFICE

This document contains the amendments made under Section 49 and is correct for printing.

(54) Title: DEVICE AT A HYDRAULIC LIFTING TABLE

(57) Abstract

Arrangement for a hydraulic lifting table of the scissor type with at least two pairs of scissor arms (1, 2) pivotally attached to one another. These are attached at their ends to a lower frame section (3) and an upper table section (4) in such a way as to be capable of pivoting and rolling. The arrangement also comprises a centrally positioned power transmission arrangement pivotally attached to the frame section, being preferably a hydraulic cylinder, the piston rod (8) of which is so arranged as to engage via rollers (9) with guide curves (10, 11). One (10) of these is attached to the frame section (3), and the other (11) is operatively connected to a pair of scissor arms (1). The guide curves (10, 11) are moved towards and away from one another by means of the rollers (9) for the purpose of raising the lifting table and vice versa. A characteristic feature of the invention is the fact that the table section (4) has the form of a plain symmetrical 'E', in which cross-pieces of the 'E'-shape cover the pairs of scissor arms (1, 2) and the power transmission arrangement (7, 8), and that the guide curves (10, 11) are centrally positioned, i.e. in the vicinity of the hydraulic cylinder (7), and that the operative connection constists of a shaft (12) pivotally mounted in the frame section (3), which shaft constitutes the operative connection between the guide curve (11) and the pair of scissor arms (1).



Device at a hydraulic lifting table

The present invention relates to an arrangement for a hydraulic lifting table of the scissor type with at least two pairs of scissor arms pivotally attached to one another, which scissor arms are attached at their ends to a lower frame section and to an upper table section in such a way as to be capable of pivoting and rolling, and a centrally positioned power transmission arrangement pivotally attached to the frame section, being preferably a hydraulic cylinder, the piston rod of which is so arranged as to engage via rollers with guide curves, one of which is attached to the frame section, and the other is operatively connected to a pair of scissor arms, and which are moved towards and away from one another by means of the rollers for the purpose of raising the lifting table and vice versa.

In the case of such lifting tables of a previously disclosed kind, it is difficult to manoeuvre a load up onto the lifting table by hand using a so-called hand pallet truck; this is because the smallest difference in height between the upper surface of the lifting table and a level floor on which the lifting table is resting is so great that an inclined plane is necessary in order to equalize the difference in height. In the absence of special lifting equipment, it will be necessary, if the load weighs more than one is able to lift manually, to use the lifting table to lift both the hand pallet truck and the load.

The object of the present invention is to make available a hydraulic lifting table which permits the load, with the help of the hand pallet truck, to be placed on the lifting table, which is made possible by the table section having the form of a plain symmetrical 'E', in which the cross-pieces of the 'E'-shape cover the pairs of scissor arms and the power transmission arrangement, by the guide curves being centrally positioned, i.e. in the vicinity of the hydraulic cylinder, and by the operative connection consisting of a shaft pivotally mounted in the frame

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section, which shaft constitutes the operative connection between the guide curve and the pair of scissor arms.

Accessibility is further increased through the table section having the form of a plain symmetrical 'E', in which the cross-pieces of the 'E'-shape cover the pairs of scissor arms and the power transmission arrangement.

The fact that all the guide curves in accordance with a particular characteristic feature are of identical profile means that the above-mentioned smallest difference in height is as small as possible.

The invention is described below in further detail with reference to the accompanying drawing, in which Fig. 1 illustrates in perspective view one embodiment of a lifting table in accordance with the invention, with the table in a raised position. Fig. 2 is a perspective view which illustrates the lifting table in accordance with Fig. 1 in the collapsed state. Figs. 3 and 4 shows a cross-section through the lifting table in Figs. 1 and 2.

A hydraulic lifting table in accordance with the invention comprises two articulated pairs of scissor arms 1, 2, a lower frame section 3 and an upper table section 4. The pair of scissor arms 1 is connected at its lower end in such a way as to articulate with the frame section 3, and is equipped at its upper end with rollers 5 by means of which the pair of scissor arms 1 rolls against the table section 4. The pair of scissor arms 2 is similarly connected at its upper end in such a way as to articulate with the table section 4, and is equipped at its lower end with rollers 6 enabling it to roll against the frame section 3.

For the purpose of raising and lowering the lifting table there is provided a centrally positioned power tramnsission arrangement 7 which is pivotally attached to the frame section 3, being

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preferably a hydraulic cylinder, the piston rod 8 of which is equipped at its outer end with rollers 9. These are so arranged as to engage with guide curves 10, 11, one 10 of which is attached to the frame section 3, and the other 11 is operatively connected to the pair of scissor arms 1. A construction of this kind is previously disclosed and functions as follows: as the cylinder piston is forced out, the curves 10, 11 are forced apart by the rollers 9, causing the table section 4 to be raised. A similar procedure, but in reverse, takes place for lowering the table section 4.

According to the invention the guide curves 10, 11 are also centrally positioned, i.e. in the immediate vicinity of the cylinder 7. The operative connection between the guide curves 11 and the pair of scissor arms 1 consists of a shaft 12 pivotally mounted in the frame section 3.

The advantage mentioned by way of introduction to the effect that the forks of a truck can be introduced into the spaces indicated by 13 in Figs. 1 and 2 is achieved through the construction in accordance with the invention. The load which is supported by the forks can thus be positioned simply on top of the table section 4 and can then be raised by the lifting table to the desired height. The truck need not be raised in conjunction with this, but can remain on the floor. The lifting table can, of course, also be used for moving a load conveniently from the table section 4 to the forks of a fork truck.

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THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:-

1. Arrangement for a hydraulic lifting table of the scissor type with at least two pairs of scissor arms pivotally attached to one another, which scissor arms are attached at their ends to a lower frame section and an upper table section in such a way as to be capable of pivoting and rolling, and a centrally positioned power transmission arrangement pivotally attached to the frame section, so as to engage via rollers with guide curves, one of which is attached to the frame section, and the other is operatively connected to a pair of scissor arms, and which are moved towards and away from one another by means of the rollers for the purpose of raising the lifting table and vice versa, characterized in that the table section has the form of a plain symmetrical 'E', in which the 3 cross-pieces of the 'E'-shape cover the pairs of scissor arms and the power transmission arrangement, in that the guide curves are centrally positioned, i.e. in the vicinity of the power transmission arrangement, ~~hydraulic cylinder,~~ and in that the operative connection consists of a shaft pivotally mounted in the frame section, which shaft constitutes the operative connection between the guide curve and the pair of scissor arms.

2. Arrangement according to claim 1, characterized in that all the guide curves are of identical profile.

3. Arrangement according to claim 1, in which said power transmission arrangement is an hydraulic cylinder, a piston rod of which is so arranged as to engage, via said rollers with the guide curves.

DATED this 25th day of October 1988

HYMO AB
Patent Attorneys for the
Applicant:

F.B. RICE & CO.

AUSTRALIAN PATENT OFFICE

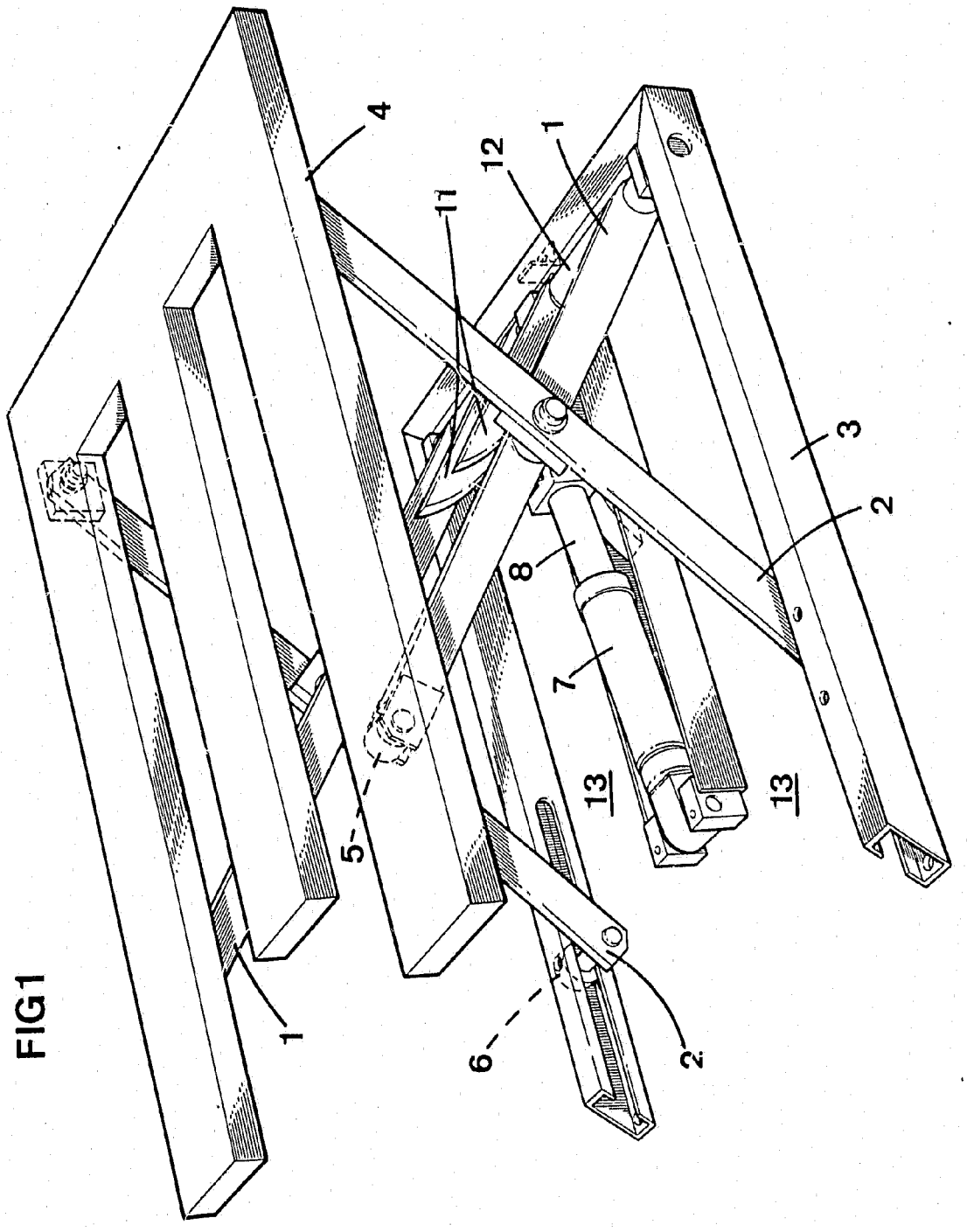


FIG1

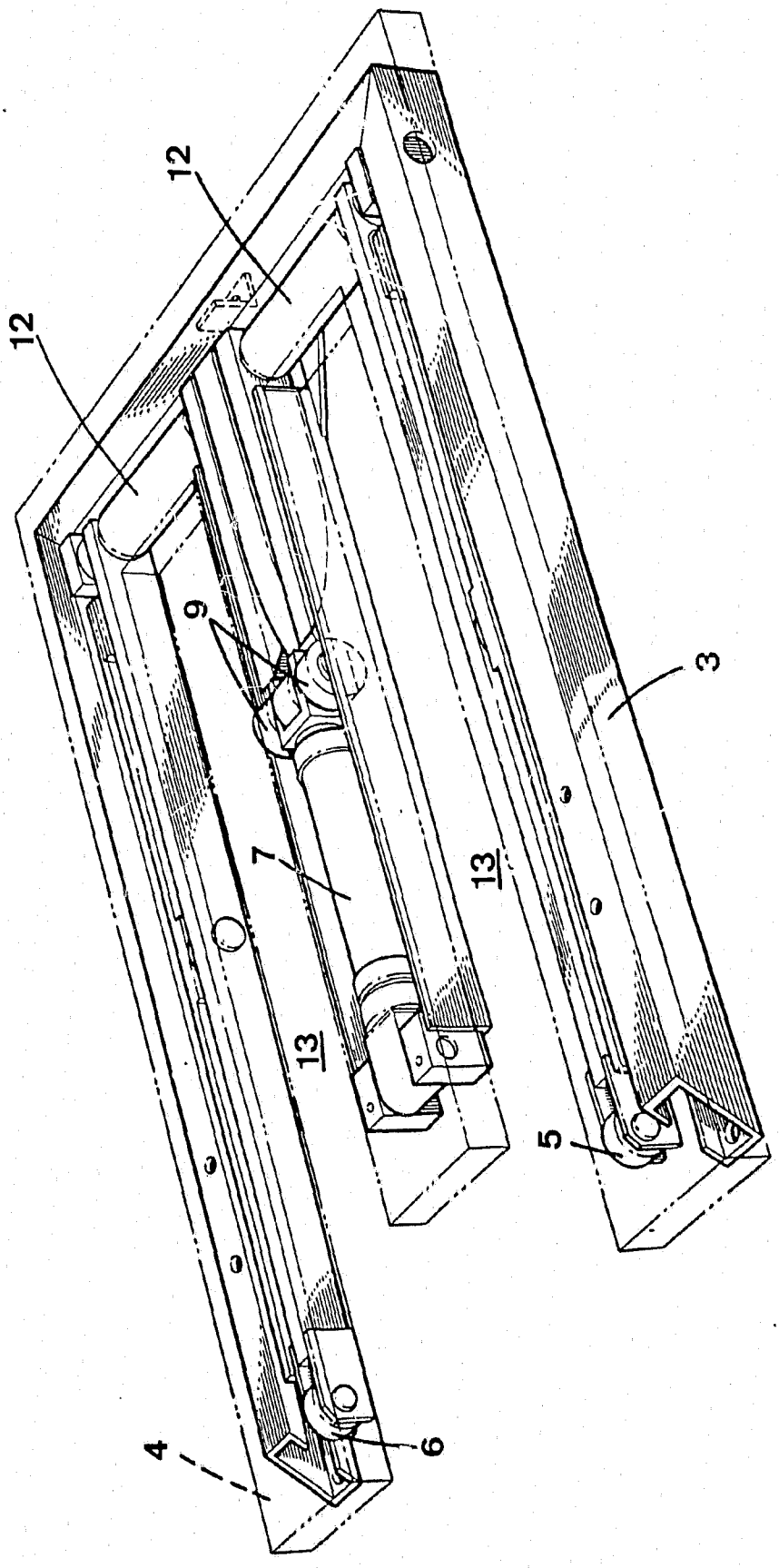


FIG 2

FIG 4

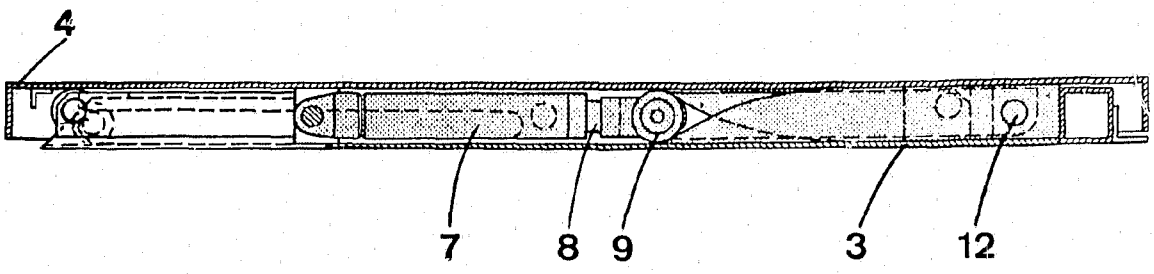
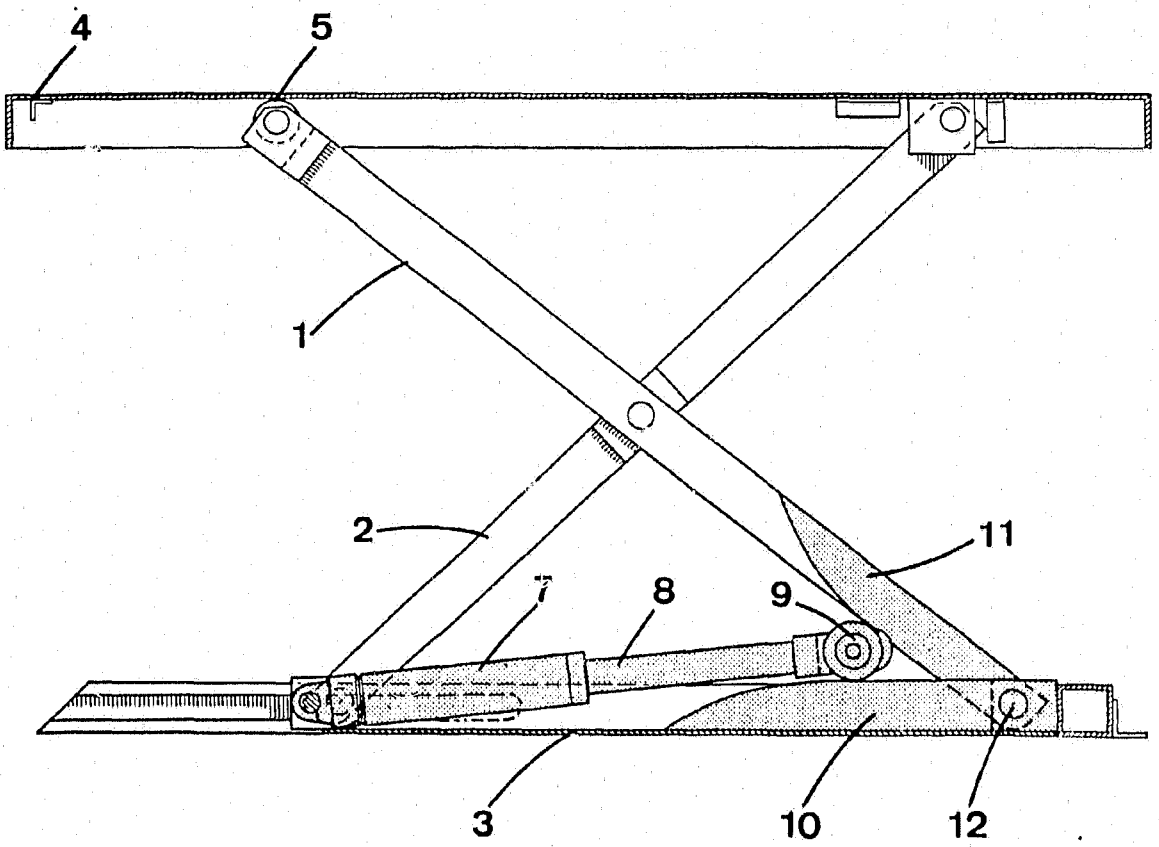


FIG 3



INTERNATIONAL SEARCH REPORT

International Application No PCT/SE86/00165

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [6]

According to International Patent Classification (IPC) or to both National Classification and IPC 4

B 66 F 7/08, B 66 F 3/22

II. FIELDS SEARCHED

Minimum Documentation Searched [7]

Classification System	Classification Symbols
IPC 4	B 66 F 3/22, 7/00, /06-/08; B 65 D 19/36-/40; B 65 G 69/22-/26; E 04 G 1/22

.../...

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched [8]

SE, NO, DK, FI classes as above

III. DOCUMENTS CONSIDERED TO BE RELEVANT [9]

Category *	Citation of Document, [11] with indication, where appropriate, of the relevant passages [12]	Relevant to Claim No. [13]
A	DE, A1, 2 253 765 (CONSTRUCTIONS EDMOND COIGNET) 16 August 1973	1
A	GB, A, 846 161 (TIPTON WELDED FABRICATIONS LIMITED) 24 August 1960	1, 2
A	DE, B1, 1 207 061 (VEREINIGT FLUGTECHNISCHE WERKE GESELLSCHAFT) 16 December 1965	1, 2
A	FI, B, 60 841 (KONSULTTITOIMISTO LOGMA REINO LEISSO KY) 14 December 1980	1
A	SE, B, 418 727 (K G PETTERSSON) 22 June 1981	1
A	DE, A1, 3 248 414 (OTTO NUSSBAUM GMBH & CO KG) 28 June 1984	1

* Special categories of cited documents: [10]

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
1986-06-30	1986 -07- 09
International Searching Authority	**Signature of Authorized Officer**
Swedish Patent Office	Tommy Blomberg

Form PCT/ISA/210 (second sheet) (January 1985)

FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

II Fields searched (cont)

US Cl 254: 8-9, 122;
187: 8.71-8.72, 18;
182: 63, 69, 141, 148, 157-158;
108: 56.1-/.3, 57.1

V. ☐ OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE [1]

This international search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1. ☐ Claim numbers....., because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claim numbers....., because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claim numbers....., because they are dependent claims and are not drafted in accordance with the second and third sentences of PCT Rule 6.4(a).

VI. ☐ OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING [2]

This International Searching Authority found multiple inventions in this international application as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.

2. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:

3. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:

4. ☐ As all searchable claims could be searched without effort justifying an additional fee, the International Searching Authority did not invite payment of any additional fee.

Remark on Protest

☐ The additional search fees were accompanied by applicant's protest.

☐ No protest accompanied the payment of additional search fees.

(19)中华人民共和国国家知识产权局

(12)实用新型专利

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(51)Int.Cl.
A47B 9/16(2006.01)
A47B 21/02(2006.01)

(ESM)同样的发明创造已同日申请发明专利

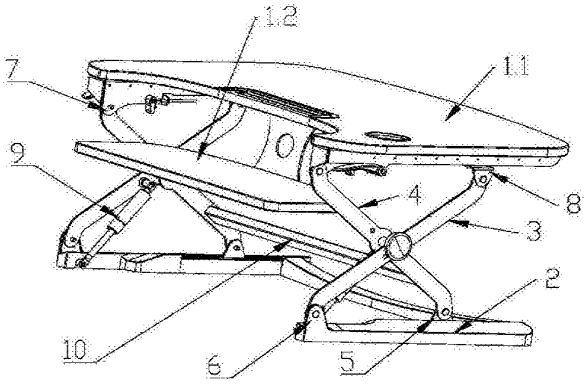
权利要求书1页 说明书3页 附图5页

(54)实用新型名称

升降工作台

(57)摘要

本实用新型提供一种升降工作台，它包括下支座、上支座，所述下支座和上支座之间设有至少一组X型升降机构，所述升降工作台还包括弹性元件，所述弹性元件的第一端连接在所述第一支杆或第二支杆的两端点之间，弹性元件的第二端连接在下支座或相对于下支座可滑动的第二铰接座上，所述弹性元件用于抵消或部分抵消上支座承重。本实用新型通过弹性元件来提供支撑力，用于抵消或部分抵消上支座承重，这样可以将工作台停留在任意高度，结构简单，成本较低。而且采用这种X型升降机构，在上支座升降的过程中，上支座的前后位置不会发生变化，比较实用。



CN 204949970 U

1. 一种升降工作台，它包括下支座、上支座，所述下支座和上支座之间设有至少一组 X 型升降机构，其特征在于：所述每组 X 型升降机构包括两个中间位置相互铰接成 X 型的支杆：第一支杆和第二支杆，所述下支座上设有固定在下支座上的第一铰接座以及相对于下支座可滑动的第二铰接座，所述上支座上设有固定在上支座上的第三铰接座以及相对于上支座可滑动的第四铰接座，所述第一支杆的下端与第一铰接座铰接，上端与第四铰接座铰接，所述第二支杆的下端与第二铰接座铰接，上端与第三铰接座铰接，所述升降工作台还包括弹性元件，所述弹性元件的第一端连接在所述第一支杆或第二支杆的两端点之间，弹性元件的第二端连接在下支座或相对于下支座可滑动的第二铰接座上，所述弹性元件用于抵消或部分抵消上支座承重。

2. 根据权利要求 1 所述的升降工作台，其特征在于：所述弹性元件设置在下支座和第一支杆之间，所述弹性元件的第一端与下支座铰接，弹性元件的第二端与第一支杆铰接。

3. 根据权利要求 1 所述的升降工作台，其特征在于：所述弹性元件设置在第二铰接座和第二支杆之间，所述弹性元件的第一端与第二铰接座铰接，弹性元件的第二端与第二支杆铰接。

4. 根据权利要求 2 或 3 所述的升降工作台，其特征在于：所述弹性元件为压缩气弹簧或机械压缩弹簧。

5. 根据权利要求 1 所述的升降工作台，其特征在于：所述弹性元件设置在下支座和第二支杆之间，所述弹性元件的第一端与下支座铰接，弹性元件的第二端与第二支杆铰接。

6. 根据权利要求 1 所述的升降工作台，其特征在于：所述弹性元件设置在第二铰接座和第一支杆之间，所述弹性元件的第一端与第二铰接座铰接，弹性元件的第二端与第一支杆铰接。

7. 根据权利要求 5 或 6 所述的升降工作台，其特征在于：所述弹性元件为拉伸气弹簧或拉簧。

8. 根据权利要求 1 所述的升降工作台，其特征在于：所述上支座上设有滑轨，所述第四铰接座在滑轨中滑动，所述第四铰接座上沿滑轨方向设有条形滑动块，所述滑动块上沿所述第四铰接座的滑动方向设有若干个槽孔，所述上支座上还设有一销子，所述销子通过一拉索及扳手控制，用于控制销子插入槽孔或者脱离槽孔。

9. 根据权利要求 1 所述的升降工作台，其特征在于：所述上支座上还设有桌板，桌板下方设有键盘托，所述键盘托、桌板与上支座同步运动。

10. 根据权利要求 1 所述的升降工作台，其特征在于：所述 X 型升降机构有两组，分别设置在上支座的两边，所述两组 X 型升降机构之间用横板连接。

升降工作台

技术领域：

[0001] 本实用新型涉及一种升降工作台。

背景技术：

[0002] 现有技术中的升降工作台大部分是利用机械弹簧或者扭簧来提供上升的弹力，并且一般是采用支杆的结构来使得台面相对于下支座上升或下降，结构比较复杂，成本较高。

实用新型内容：

[0003] 本实用新型解决的技术问题是，克服现有的技术缺陷，提供一种结构简单、成本较低的升降工作台。

[0004] 本实用新型提供的技术方案是：本实用新型提供一种升降工作台，它包括下支座、上支座，所述下支座和上支座之间设有至少一组X型升降机构，其特征在于：所述每组X型升降机构包括两个中间位置相互铰接成X型的支杆：第一支杆和第二支杆，所述下支座上设有固定在下支座上的第一铰接座以及相对于下支座可滑动的第二铰接座，所述上支座上设有固定在上支座上的第三铰接座以及相对于上支座可滑动的第四铰接座，所述第一支杆的下端与第一铰接座铰接，上端与第四铰接座铰接，所述第二支杆的下端与第二铰接座铰接，上端与第三铰接座铰接，所述升降工作台还包括弹性元件，所述弹性元件的第一端连接在所述第一支杆或第二支杆的两端点之间，弹性元件的第二端连接在下支座或相对于下支座可滑动的第二铰接座上，所述弹性元件用于抵消或部分抵消上支座承重。

[0005] 采用上述结构后，本实用新型具有以下优点：本实用新型通过弹性元件来提供支撑力，用于抵消或部分抵消上支座承重，这样可以将工作台停留在任意高度，结构简单，成本较低。而且采用这种X型升降机构，在上支座升降的过程中，上支座的前后位置不会发生变化，比较实用。

[0006] 作为优选，所述弹性元件设置在下支座和第一支杆之间，所述弹性元件的第一端与下支座铰接，弹性元件的第二端与第一支杆铰接。

[0007] 所述弹性元件设置在第二铰接座和第二支杆之间，所述弹性元件的第一端与第二铰接座铰接，弹性元件的第二端与第二支杆铰接。

[0008] 所述弹性元件为压缩气弹簧或机械压缩弹簧。

[0009] 所述弹性元件设置在下支座和第二支杆之间，所述弹性元件的第一端与下支座铰接，弹性元件的第二端与第二支杆铰接。

[0010] 所述弹性元件设置在第二铰接座和第一支杆之间，所述弹性元件的第一端与第二铰接座铰接，弹性元件的第二端与第一支杆铰接。

[0011] 所述弹性元件为拉伸气弹簧或拉簧。

[0012] 所述上支座上设有滑轨，所述第四铰接座在滑轨中滑动，所述第四铰接座上沿滑轨方向设有条形滑动块，所述滑动块上沿所述第四铰接座的滑动方向设有若干个槽孔，所述上支座上还设有一销子，所述销子通过一拉索及扳手控制，用于控制销子插入槽孔或者

脱离槽孔。采用这种结构，可以在上支座升降到某个位置时，通过销子插入槽孔中，来固定上支座升降的位置，需要调整位置时，则通过扳手以及拉索将销从槽孔中拉出，则可以继续调节上支座的高度。

[0013] 所述上支座上还设有桌板，桌板下方设有键盘托，所述键盘托、桌板与上支座同步运动。采用键盘托可以放置键盘。

[0014] 所述 X 型升降机构有两组，分别设置在上支座的两边，所述两组 X 型升降机构之间用横板连接。采用这种结构可以使上支座两边的 X 型升降机构同步运动，而且还可以加强升降工作台的强度。

附图说明：

[0015] 附图 1 为本实用新型正面的结构示意图；

[0016] 附图 2 为本实用新型背面的结构示意图；

[0017] 附图 3 为实施例之一；

[0018] 附图 4 为实施例之二；

[0019] 附图 5 为实施例之三；

[0020] 附图 6 为实施例之四；

[0021] 附图 7 为实施例之五；

[0022] 附图 8 为实施例之六；

[0023] 附图 9 为锁止机构的结构示意图；

[0024] 附图 10 为图 9 中的 A 处放大结构示意图。

[0025] 如图所示：1、上支座，1.1、桌板，1.2、键盘托，1.3、滑轨，2、下支座，3 第一支杆，4、第二支杆，5、第二铰接座，6、第一铰接座，7、第三铰接座，8、第四铰接座，9、弹性元件，9.1、气弹簧，9.2、弹簧，10、横板，11、扳手，12、拉索，13、滑动块，14、槽孔，15、销子。

具体实施方式

[0026] 下面结合附图和具体实施例对本实用新型做详细说明：

[0027] 如图 1- 图 10 所示：本实用新型提供一种升降工作台，它包括下支座 2、上支座 1，所述下支座 2 和上支座 1 之间设有至少一组 X 型升降机构，所述每组 X 型升降机构包括两个中间位置相互铰接成 X 型的支杆：第一支杆 3 和第二支杆 4，所述下支座 2 上设有固定在下支座上的第一铰接座 6 以及相对于下支座 2 可滑动的第二铰接座 5，所述上支座 1 上设有固定在上支座 1 上的第三铰接座 7 以及相对于上支座 1 可滑动的第四铰接座 8，所述第一支杆 3 的下端与第一铰接座 6 铰接，上端与第四铰接座 8 铰接，所述第二支杆 4 的下端与第二铰接座 5 铰接，上端与第三铰接座 7 铰接，所述升降工作台还包括弹性元件 9，所述弹性元件 9 的第一端连接在所述第一支杆 3 或第二支杆 4 的两端点之间，弹性元件 9 的第二端连接在下支座 2 或相对于下支座 2 可滑动的第二铰接座 5 上，所述弹性元件 9 用于抵消或部分抵消上支座 1 承重。

[0028] 在上支座升降的过程中第二铰接座 5 和第四铰接座 8 分别相对于下支座和上支座可滑动，从而可以调节 X 型升降机构，使上支座升降。

[0029] 图 3 为实施例之一、此实施例中，所述弹性元件 9 为气弹簧 9.1、气弹簧 9.1 的第一

端连接在所述第一支杆 3 的两端点之间，气弹簧 9.1 的第二端连接在下支座 2 上。此实施例中所述气弹簧为压缩气弹簧，即该气弹簧提供向上的弹力。

[0030] 图 4 为实施例之二、此实施例中，所述弹性元件 9 为气弹簧 9.1、气弹簧 9.1 的第一端连接在所述第二支杆 4 的两端点之间，气弹簧 9.1 的第二端连接在第二铰接座 5 上。此实施例中所述气弹簧为压缩气弹簧，即该气弹簧提供向上的弹力。

[0031] 图 5 为实施例之三、此实施例中，所述弹性元件 9 为弹簧 9.2、弹簧 9.2 的第一端连接在所述第二支杆 4 的两端点之间，弹簧 9.2 的第二端连接在下支座 2 上，此实施例中，弹簧 9.2 为拉簧。即该弹簧提供收缩的拉力。

[0032] 图 6 为实施例之四、此实施例中，所述弹性元件 9 为弹簧 9.2、弹簧 9.2 的第一端连接在所述第一支杆 3 的两端点之间，弹簧 9.2 的第二端连接在上支座 1 上，此实施例中，弹簧 9.2 为拉簧。即该弹簧提供收缩的拉力。可以看出该实施例与实施例之三实际上结构相同，只是跟实施例之三为对称结构，即将本实施例中的上支座 1 看成实施例之三中的下支座 2。将本实施例中的第一支杆 3 看成实施例之三中的第二支杆 4，则该结构与实施例之三相同。这种与实施例之三对称的结构，也应在本申请保护范围之内。

[0033] 图 7 为实施例之五，此实施例为实施例之一的对称结构。

[0034] 图 8 为实施例之六，此实施例为实施例之二的对称结构。

[0035] 本申请实施例包括但不限于上述实施例。

[0036] 如图 9-10 所示，所述上支座 1 上设有滑轨 1.3，所述第四铰接座 8 在滑轨 1.3 中滑动，所述第四铰接座 8 上沿滑轨 1.3 方向设有条形滑动块 13，滑动块 13 与第四铰接座 8 同步运动，所述滑动块 13 上沿所述第四铰接座 8 的滑动方向设有若干个槽孔 14，所述上支座 1 上还设有一销子 15，所述销子 15 通过一拉索 12 及扳手 11 控制，用于控制销子 15 插入槽孔 14 或者脱离槽孔 14。采用这种结构，可以在上支座升降到某个位置时，通过销子插入槽孔中，来固定上支座升降的位置，需要调整位置时，则通过扳手以及拉索将销从槽孔中拉出，则可以继续调节上支座的高度。该结构给升降工作台提供了一个锁止机构，可以在工作台上升到一定高度时进行锁止，防止工作台下降。

[0037] 所述上支座 1 上还设有桌板 1.1，桌板 1.1 下方设有键盘托 1.2，所述键盘托 1.2、桌板 1.1 与上支座 1 同步运动。如果将上支座 1 放到下面，将下支座 2 放到上面，则可以在下支座 2 上设置桌板和键盘托，这种结构实际上与本申请所述结构相同。

[0038] 所述 X 型升降机构有两组，分别设置在上支座 1 的两边，所述两组 X 型升降机构之间用横板 10 连接。采用这种结构可以使上支座两边的 X 型升降机构同步运动，而且还可以加强升降工作台的强度。

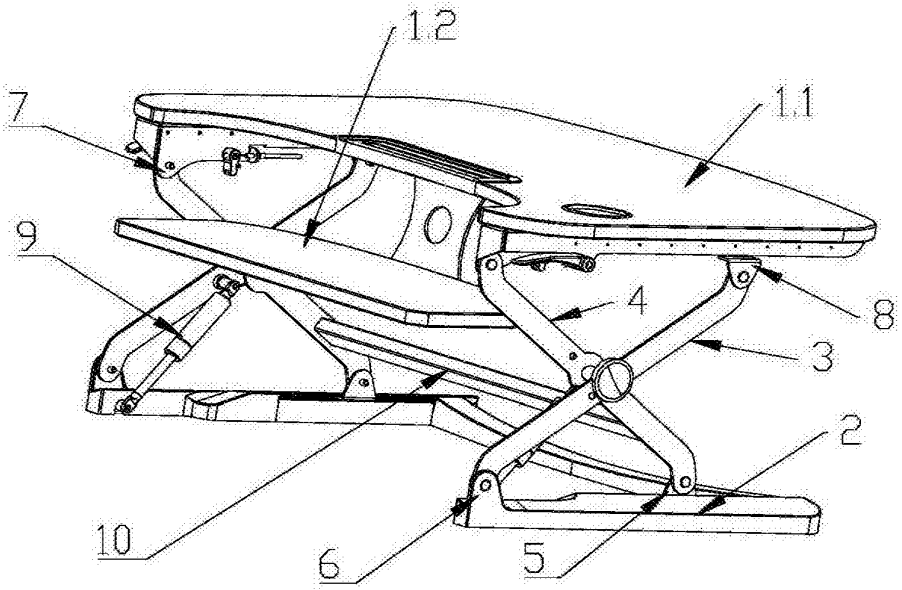


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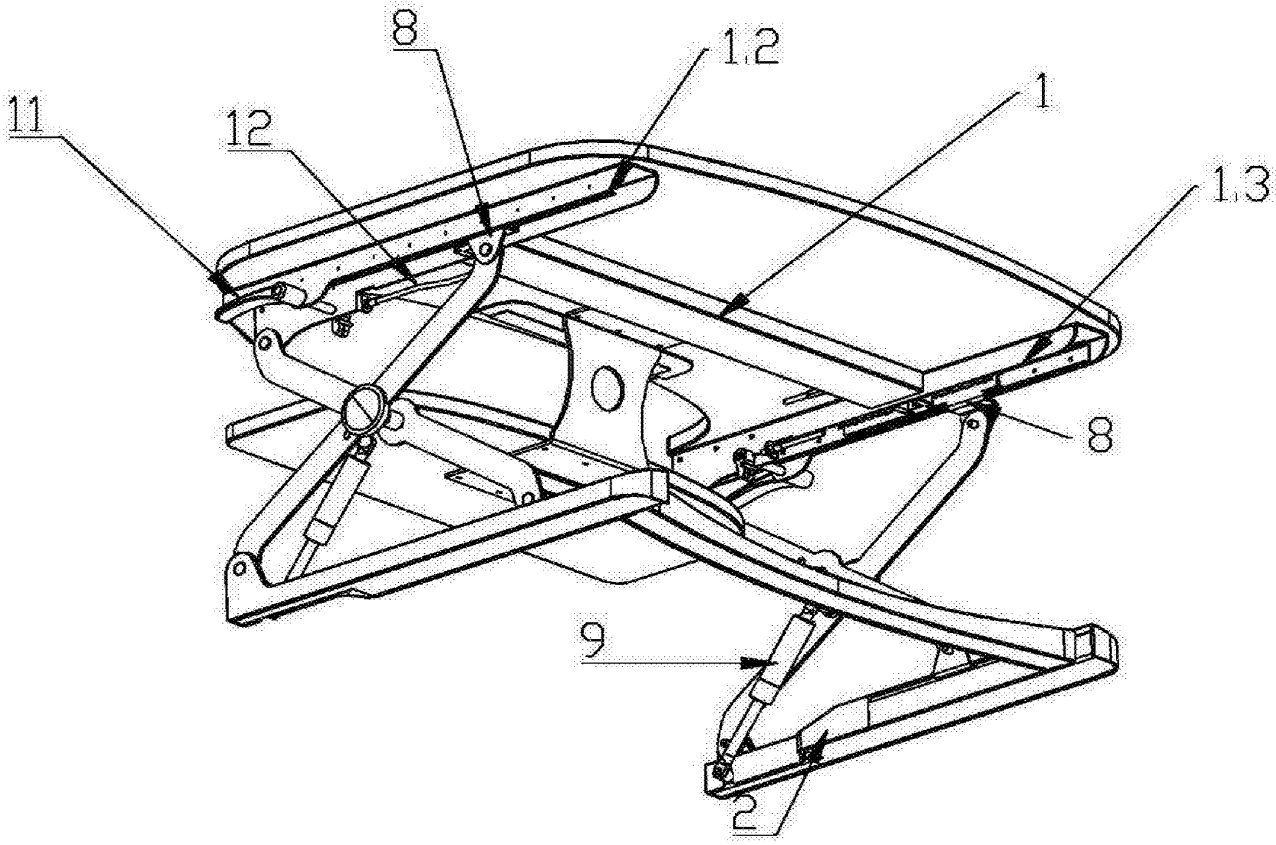


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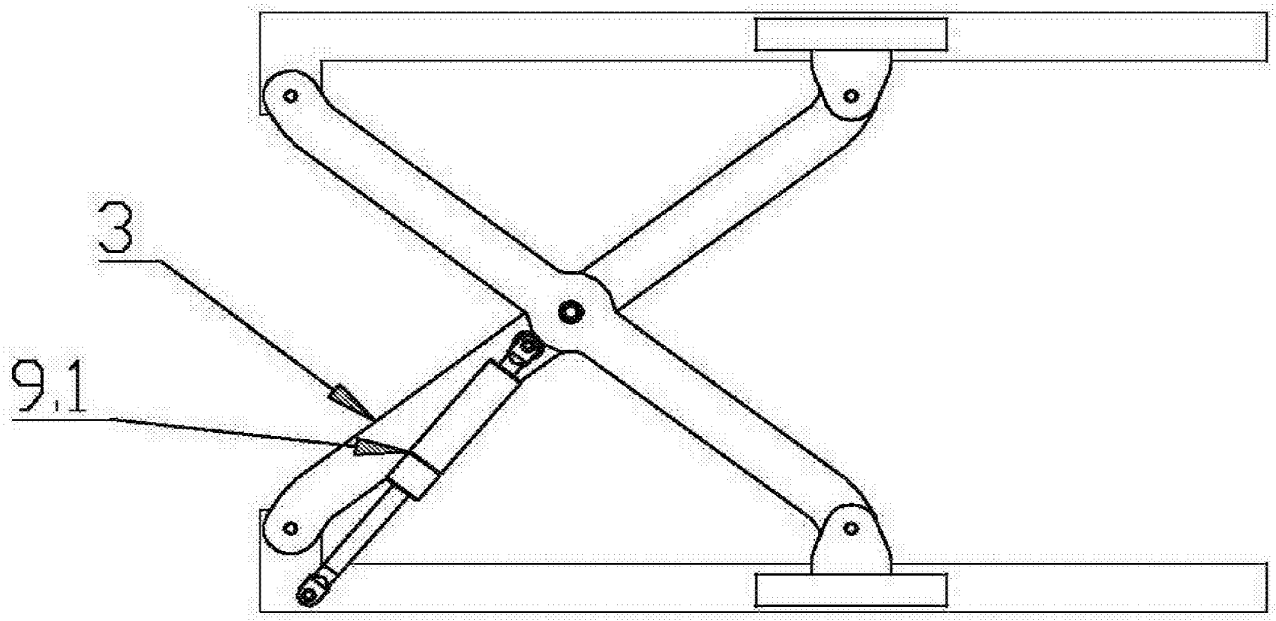


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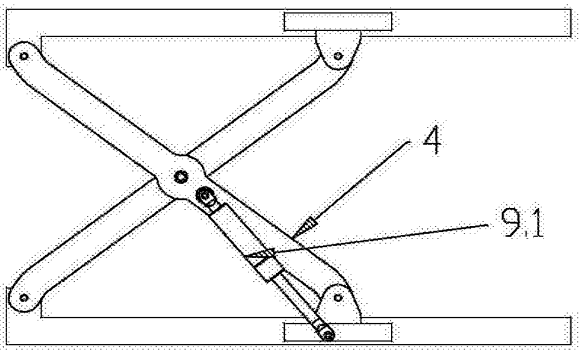


图 4

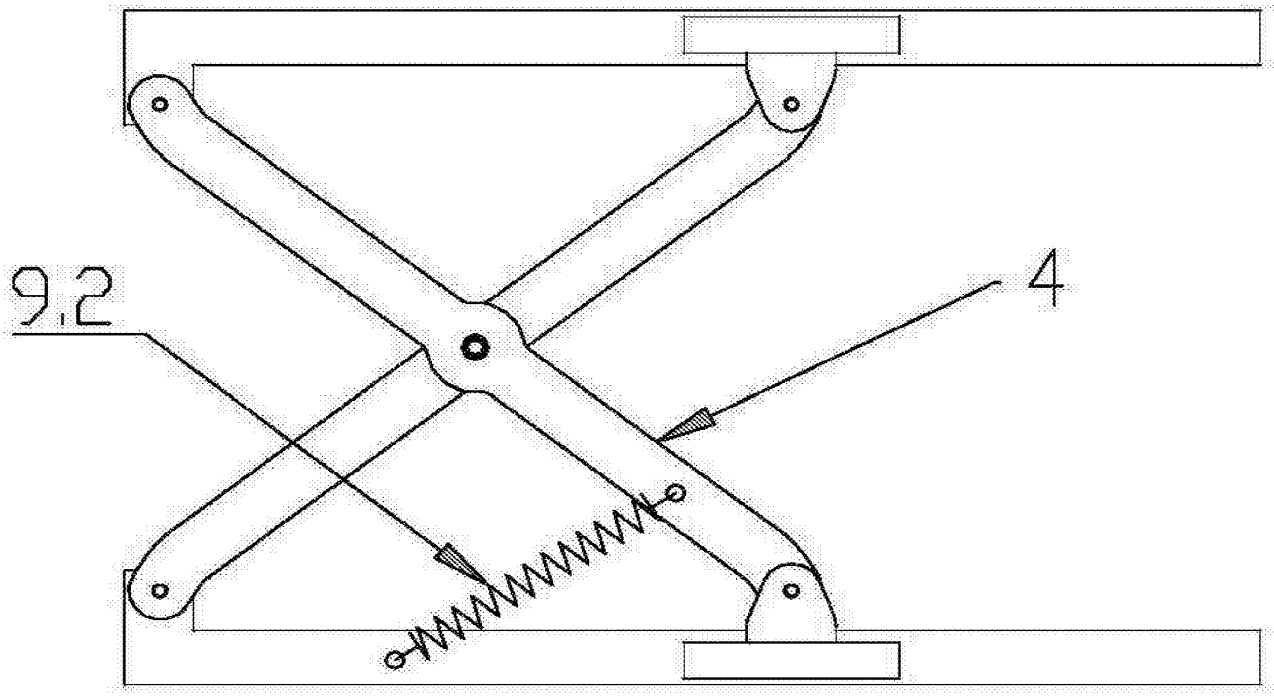


图 5

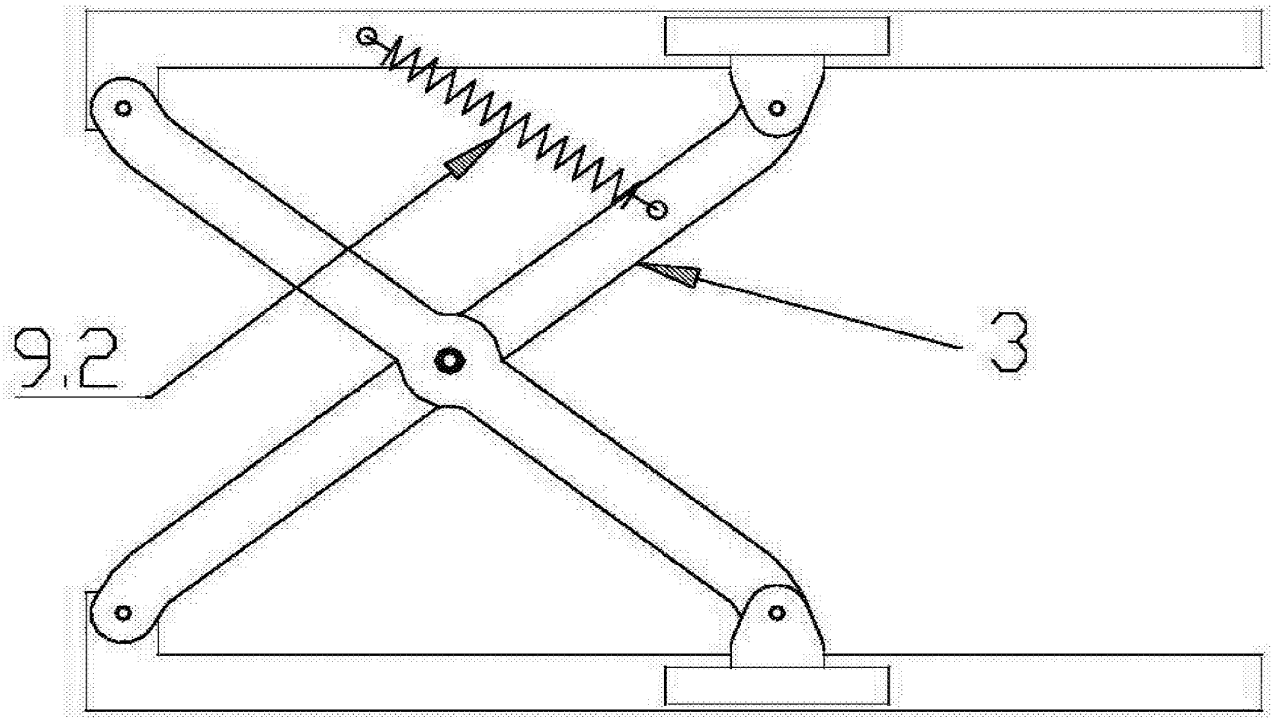


图 6

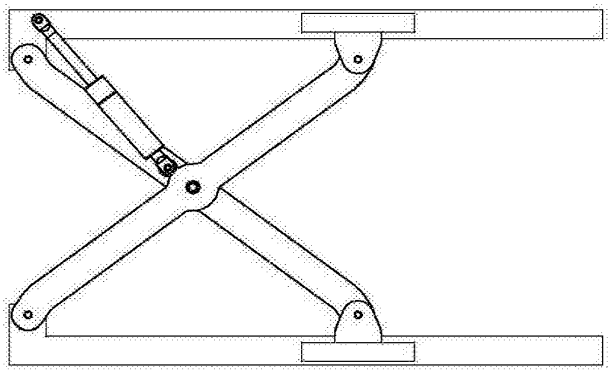


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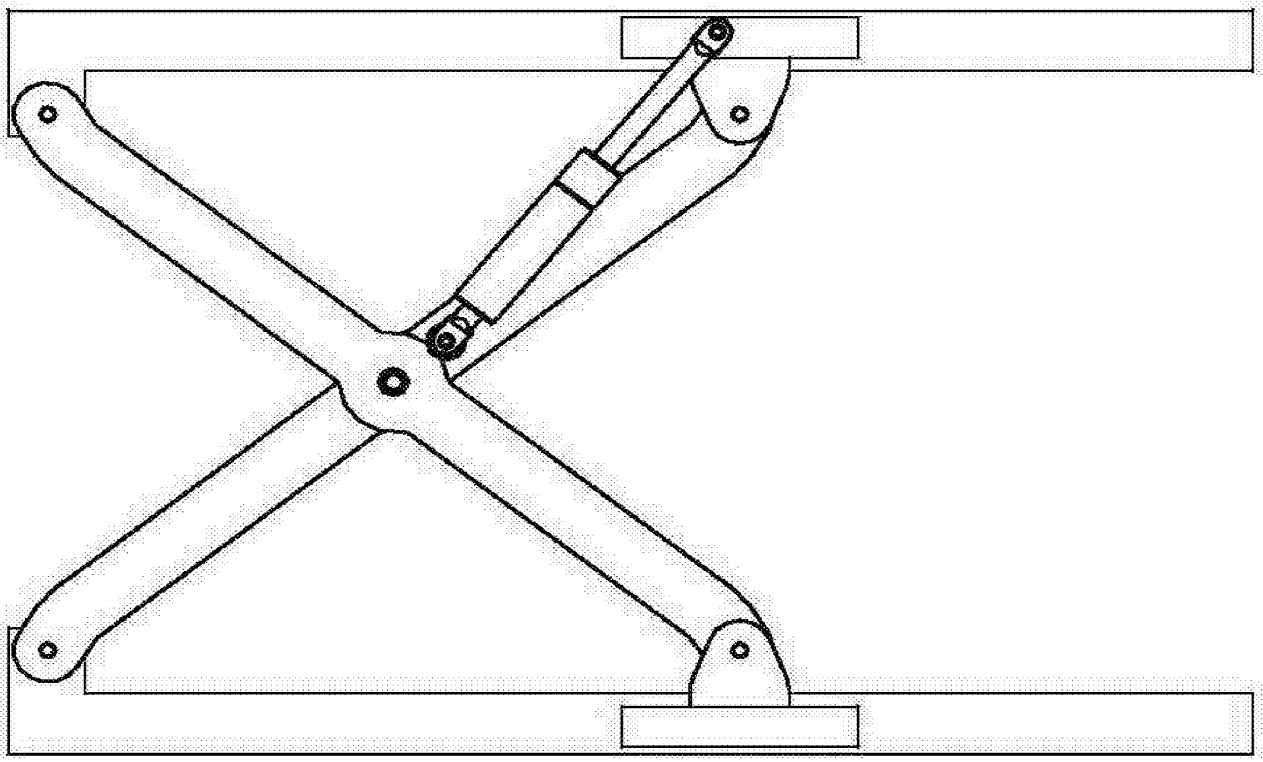


图 8

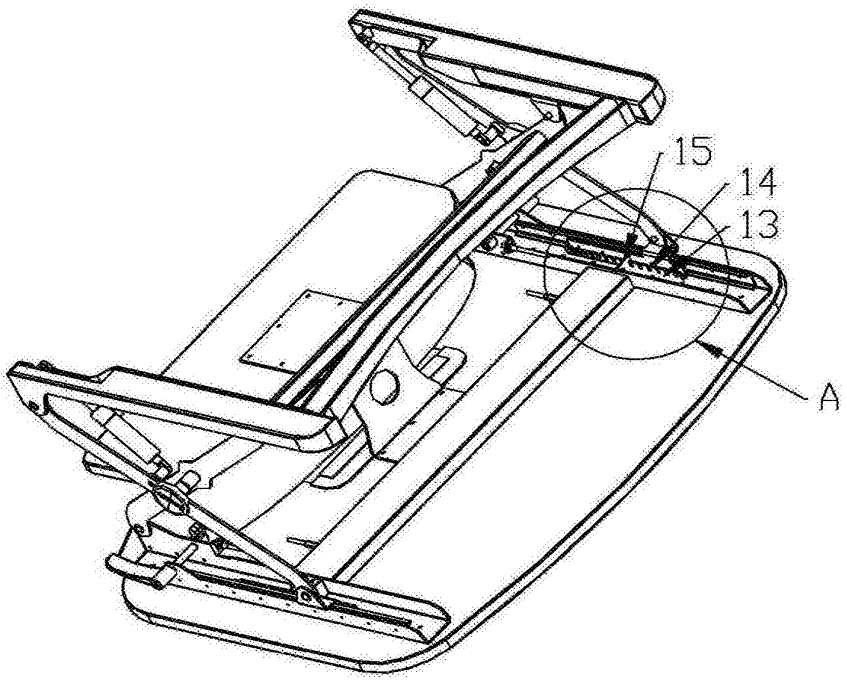


图 9

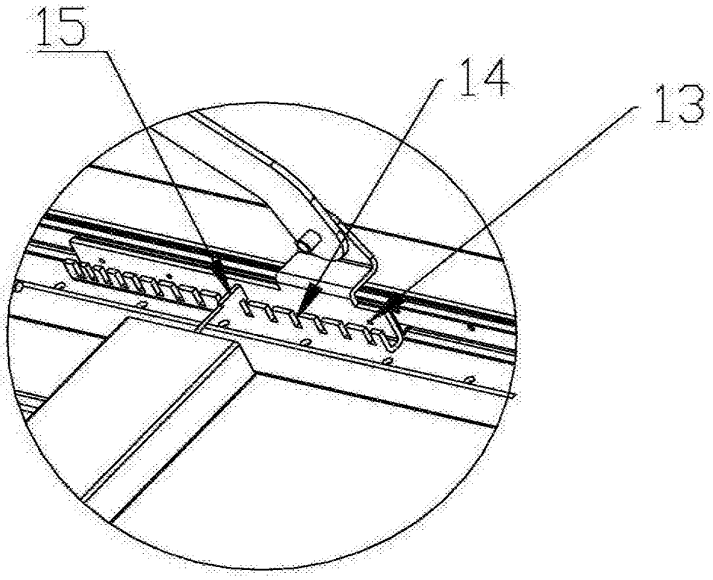


图 10

Electronic Acknowledgement Receipt

EFS ID:	47887125
Application Number:	17493830
International Application Number:	
Confirmation Number:	4682
Title of Invention:	DESKTOP WORKSPACE THAT ADJUSTS VERTICALLY
First Named Inventor/Applicant Name:	Nathan Mark Poniatowski
Customer Number:	155431
Filer:	Daniel Thomas Lund
Filer Authorized By:	
Attorney Docket Number:	1001-001US13
Receipt Date:	23-APR-2023
Filing Date:	04-OCT-2021
Time Stamp:	23:23:33
Application Type:	Utility under 35 USC 111(a)

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Payment Type	CARD
Payment was successfully received in RAM	$104
RAM confirmation Number	E20234MN24109307
Deposit Account	602335
Authorized User	Daniel Lund

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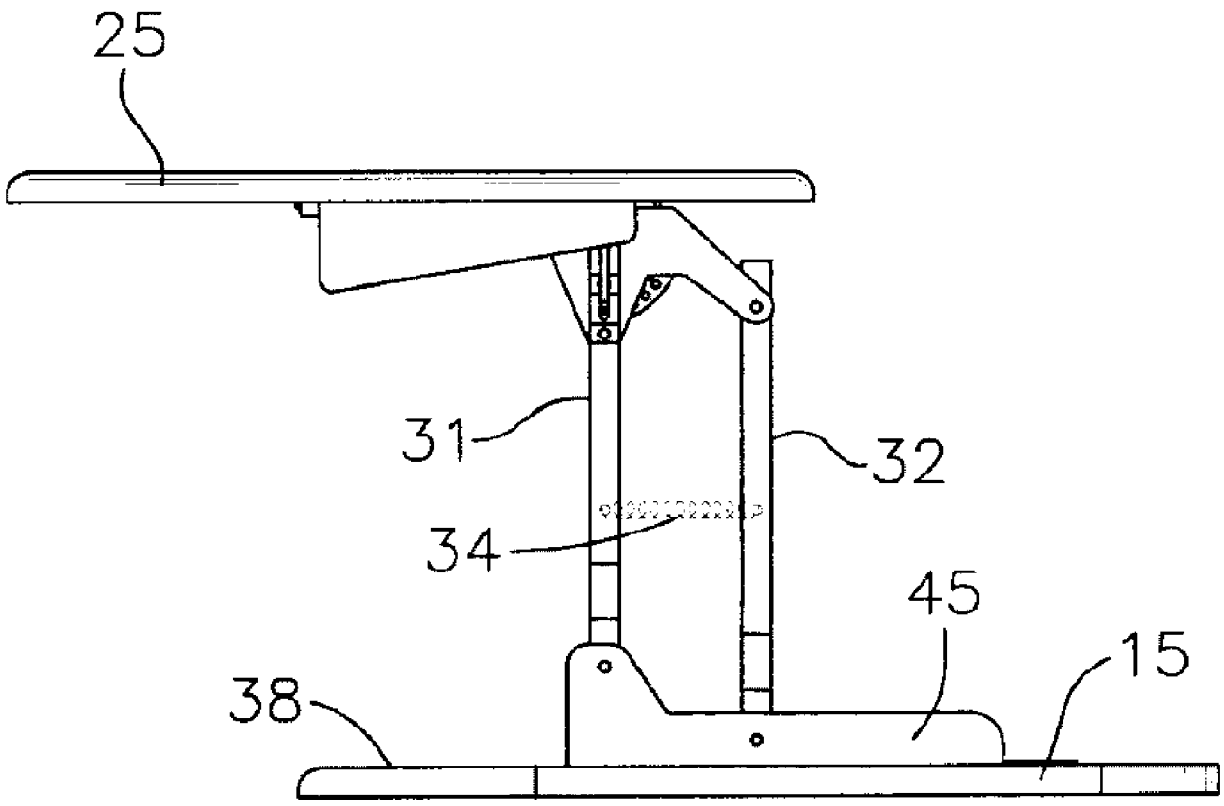
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(54) **Titre : PLATEFORME DE BUREAU REGLABLE**
(54) **Title: ADJUSTABLE DESKTOP PLATFORM**



(57) **Abrégé/Abstract:**
An adjustable desktop workspace is disclosed having a base having a lower platform, an upper platform, and two pivoting arms mounted between the two. Each pivoting arm has a front and rear bracket. A locking lever on each arm fixedly engages the platform in an upright position at a variety of levels above the lower platform. There are also two stabilizing bars to limit side-to-side relative movement, and a biasing spring between the front and rear brackets to aide moving the upper platform.

ABSTRACT OF THE DISCLOSURE

An adjustable desktop workspace is disclosed having a base having a lower platform, an upper platform, and two pivoting arms mounted between the two. Each pivoting arm has a front and rear bracket. A locking lever on each arm fixedly engages the platform in an upright position at a variety of levels above the lower platform. There are also two stabilizing bars to limit side-to-side relative movement, and a biasing spring between the front and rear brackets to aide moving the upper platform.

BACKGROUND OF THE INVENTION

TITLE OF THE INVENTION

[0001] Adjustable Desktop Platform

BACKGROUND OF THE INVENTION

Field of the Invention:

[0002] This invention relates to ergonomic workplace environments, and more particularly to an adjustable desktop platform.

[0003] Sitting for long periods of time during the work day is not good for one's health and wellness. Medical studies show that sitting increases the rate of all-cause mortality, especially from cardiovascular disease, diabetes and obesity, for example. People who sit for most of the day are 50 percent more likely to die of heart attacks. Even if you exercise, the longer you sit the greater the chances you will die. Sitting shuts down the circulation of the fat-absorbing enzyme lipase, while standing up engages muscles and promotes the distribution of lipase, which prompts the body to process fat and cholesterol, independent of the amount of time spent exercising.

[0004] There are desks available to be used while standing, and even desks adapted for use while a user is on a treadmill.

[0005] However, standing for very long periods of time to work is more tiring, dramatically increases the risks of carotid atherosclerosis because of the additional load on the circulatory system, and increases the risks of varicose veins.

[0006] Taking regular breaks from sitting for prolonged periods of time can have several positive outcomes. For example, standing can provide more energy during the

work day. In addition, because standing burns more calories than sitting, standing can also result in weight loss without changes in diet or exercise. It is also harder to become more tired or lose focus when standing.

[0007] Because regular breaks from sitting are beneficial, and because many people during the work day want to remain productive while taking breaks from sitting, and because everyone will sit and stand for different lengths of time at different times during the day, there exists a need to create a work environment that is ergonomic for someone standing as well as sitting, and allows the transition to be easy, quick and simple.

BRIEF SUMMARY OF THE INVENTION

[0008] A primary advantage of the present invention is to provide an adjustable desktop platform that can transition between a lower operating position and an upper operating position quickly, easily and simply.

[0009] A related advantage of the present invention is to provide an adjustable desktop platform that can transition between a lower operating position and a variety of higher positions.

[0010] Another advantage of the present invention is to provide an adjustable desktop platform that can convert existing desktop workspaces to height-adjustable workspaces.

[0011] In accordance with a preferred embodiment of the present invention, an

adjustable desktop workspace comprises a base having a lower platform; an upper platform; two pivoting arms mounted between the base and the upper platform, each pivoting arm further comprised of a front and rear bracket; and a locking lever on each arm for fixedly engaging the platform in an upright position.

[0012] In accordance with another preferred embodiment of the present invention, an adjustable desktop workspace comprises an upper and lower platform hingedly connected by a first and second arm assembly; the first and second assembly comprised of a front and rear member; the members each having a first end and a second end, wherein said first end is connected to the base, and wherein the second end is connected to said platform; the front member is operably engaged to the rear member by a biasing mechanism; and a lever for locking engagement of the first and second arm assembly in an upright position.

[0013] Other objects and advantages will become apparent from the following descriptions, taken in connection with the accompanying drawings, wherein, by way of illustration and example, an embodiment of the present invention is disclosed.

BRIEF DESCRIPTION OF THE FIGURES

[0014] The invention, as well as a preferred mode of use and further objectives and advantages thereof, will best be understood by reference to the following detailed description when read in conjunction with the accompanying Figures wherein:

[0015] Figure 1 is a perspective, cutaway view of a preferred embodiment of the adjustable desktop platform invention shown in fully upright position.

[0016] Figure 2 is a top view of the embodiment of Figure 1.

[0017] Figure 3 is a front view of the embodiment of the invention shown in Figure 1.

[0018] Figure 4 is a side view of the embodiment of the invention shown in Figure 1.

[0019] Figure 5 is an exploded view of the preferred embodiment of the adjustable desktop platform shown in Figure 1.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0020] Detailed description of the preferred embodiment is provided herein. It is to be understood, however, that the present invention may be embodied in various forms. Various aspects of the invention may be inverted, or changed in reference to specific part shape and detail, part location, or part composition. Therefore, specific details disclosed herein are not to be interpreted as limiting, but rather as a basis for the claims and as a representative basis for teaching one skilled in the art to employ the present invention in virtually any appropriately detailed system, structure or manner.

[0021] This specification outlines the development of an ergonomic work environment to allow a user to work while sitting or standing, and to transition between the two positions easily, quickly and simply.

[0022] This invention uses an adjustable desktop platform along with a system of spring aided pivoting arms and a multi-positional, adjustable, locking mechanism to raise and lower the desktop platform to provide a work space at a level useable for

someone in a sitting position, and transition to provide a work space useable for someone in a standing position. The invention includes counterweights, covers and supports for added safety.

[0023] Turning first to Figure 1, there is shown an adjustable desktop platform 10 according to an illustrated embodiment of the invention. Adjustable desktop platform 10 includes a base platform 15 intended to set on an existing worker's desk. The desktop platform 25 is separated from base platform 15 by a predetermined space. The space between base platform 15 and desktop platform 25 can be large enough to store a computer keyboard and mouse, and allow for the use thereof. In addition, shown in Figure 1 is a spring-loaded pivoting bracket assembly 28 connecting base platform 15 and desktop platform 25. As will be described in connection with Figure 5, below, a locking mechanism is also included so as to prevent the unintended change in position of adjustable desktop platform 10, as well as allow the stability of adjustable desktop platform 10 to support a laptop computer, computer monitor, keyboard and/or computer mouse.

[0024] In the lowered position, pivoting brackets 31 and 32 are in a generally horizontal position and desktop platform 25 is over base platform 25, whereas in the fully upright position, desktop platform 25 is raised with pivoting brackets 31 and 32 in the generally vertical position. In the fully upright position, desktop platform 25 is also moved forward closer to the user, relative to base platform 15. Because desktop platform 25 is designed to be used in a workspace environment, and would likely have computer equipment such as screen, keyboard and mouse thereon, the added forward weight is counterbalanced by counterweight 35 shown towards the far end of base

platform 15. As will be appreciated, the specific weight of counterweight 35 can be modified to the particular environment design and may depend on the weight of the desktop, the length of the pivoting arms and the shape of the desktop platform, among other things.

[0025] As is shown in Figure 1 and Figure 5, base platform 15 may also include a removable insert 38. Removable insert 38 can easily be removed or inserted depending upon the user's individual preferences for their workspace. As shown in Figure 3, but omitted in other figures to allow the illustration of other mechanical features, there are also included side covers 41 and 42 on the side ends of base platform 15. Side covers 41 and 42 provide a safety feature so that when a user is adjusting desktop platform 10 up or down, the user's fingers and/or other things are less likely to get caught in the moving mechanism. Further, side covers 41 and 42 provide an aesthetically pleasing view, rather than a user seeing the mechanical assemblies.

[0026] Turning next to Figure 3, Figure 4 and Figure 5, there is shown in more detail the adjusting mechanism of the present invention. Specifically, in Figure 3, left and right pivoting brackets 28 are shown. Each pair of pivoting brackets 28 includes a forward multi-positional, adjustable pivoting bracket 31, as well as a rear stabilizing pivoting bracket 32 as shown in Figure 4. Each bracket is secured to base platform 15 and the desktop platform 25 through the generally L-shaped attaching brackets 45 shown, which are secured to the respective platforms through, for example, screws.

[0027] Springs 34 are also included to assist the user in countering the weight of the desktop platform 25 and any material thereon, such as a computer, screen, keyboard and mouse, to allow for smooth, easy raising and lowering of the desktop platform.

Springs 34 are shown in Figure 5. Each spring 34 is connected between forward pivoting bracket 31 and rear pivoting bracket 32. In the fully upright position, springs 34 are in the natural, relaxed position, and in the fully lowered position, springs 34 are in the stretched position. Alternate spring-assisted designs are readily appreciated. As will be appreciated, the size, length, and spring force of the springs can be chosen for the particular anticipated environment, including the desktop weight, the anticipated weight of material on the desktop, the strength of the users, etc.

[0028] For additional security and stability, there is also included a locking mechanism 50, which also secures desktop platform 25 at a variety of distances from base platform 15. This feature is accomplished by the series of holes 51 in each of forward pivoting brackets 31. The series of holes 51 interacts with the pins and brackets 55 as shown in detail in Figure 5. These pins fit in forward pivoting bracket holes 51 and prevent further movement of the desktop platform relative to the base platform. The pins are inserted into and removed from holes 50 by the levers 62 on either side of desktop platform 25 and are secured to the underside of desktop platform 25 by retaining brackets 64. Each lever 62 is connected by a wire 67 to pins such that by movement of the lever, the pins may be inserted into or removed from the holes of forward pivoting bracket 31. The wire is not shown in Figure 5, so as to not obscure the remaining features, though is understandable by those in the art. In the preferred embodiment, lever 62 is connected by wire 67 to the near set of pins, though may be connected to the far set of pins, depending upon the desired design and environment.

[0029] Forward lateral stabilizing bar 72 and rear lateral stabilizing bar 75 or supports are also shown in Figure 5 and are employed to help reduce unwanted side-to-side relative movement between base platform 15 and desktop platform 25.

[0030] While the invention has been described in connection with a preferred embodiment, it is not intended to limit the scope of the invention to the particular form set forth, but on the contrary, it is intended to cover such alternatives, modifications, and equivalents as may be included within the spirit and scope of the invention as defined by the currently or later appended claims.

What is claimed is:

1. An adjustable desktop workspace comprising:

a. an upper platform defining a work surface;

b. a base located beneath the upper platform, the base defining a bottom that is adapted to sit on an existing desk;

c. first and second sets of arms coupling the upper platform to the base, wherein the first and second sets of arms are adapted for movement of the upper platform substantially in parallel with the base between a raised position and a lowered position; and

d. a locking mechanism adapted to retain the upper platform in the raised position and in at least one intermediate position between the raised position and the lowered position, the locking mechanism including first and second locking levers extending below the upper platform, the first and second locking levers user-operable to permit movement of the upper platform with respect to the base.

2. An adjustable desktop workspace as claimed in claim 1 further comprising a removable inset in the base.

3. An adjustable desktop workspace as claimed in claim 1 further comprising:

a. one or more lateral stabilizing bars.

4. An adjustable desktop workspace as claimed in claim 3 wherein the one or more stabilizing bars include a rigid bar connecting the first and second sets of arms.

5. An adjustable desktop workspace as claimed in claim 4 wherein the one or more stabilizing bars further include a second rigid bar connecting the first and second sets of arms.

6. An adjustable desktop workspace as claimed in claim 1 wherein the locking mechanism can fixedly engage the upper platform in a plurality of positions spaced from the base.

7. An adjustable desktop workspace as claimed in claim 1 further comprising:

a. a biasing connection to easily raise and lower the upper platform.

8. An adjustable desktop workspace as claimed in claim 7 wherein the biasing connection is at least one spring connecting a front bracket and a rear bracket of at least one of the first and second sets of arms.

9. An adjustable desktop workspace as claimed in claim 8 wherein the biasing connection is a spring connecting the front bracket and rear bracket of each of the first and second sets of arms.

10. An adjustable desktop workspace comprising:

a. an upper platform and a base hingedly connected by a first arm assembly and second arm assembly, the base adapted to sit on an existing desk;

b. said first arm assembly comprised of a first front member and a first rear member and said second arm assembly comprised of a second front member and a second rear member;

c. each of said first front member, said first rear member, said second front member, and said second rear member having a first end connected to the base and a second end connected to said upper platform;

d. said first front member is operably engaged to said first rear member by a first biasing mechanism and said second front member is operably engaged to said second rear member by a second biasing mechanism;

e. a first lever for locking engagement of said first arm assembly in an upright position; and

f. a second lever for locking engagement of said second arm assembly in the upright position, wherein the first lever and the second lever are each mounted to a lower surface of the upper platform.

11. An adjustable desktop workspace as claimed in claim 10 further comprising:

a. one or more lateral stabilizing bars.

12. An adjustable desktop workspace as claimed in claim 11 wherein the one or more stabilizing bars include a rigid bar connecting the first front member and the second front member.

13. An adjustable desktop workspace as claimed in claim 12 wherein the one or more stabilizing bars further include a second rigid bar connecting the first rear member and the second rear member.

14. An adjustable desktop workspace as claimed in claim 10 wherein the first biasing mechanism is a spring connecting the first front member and the first rear member and the second biasing mechanism is a spring connecting the second front member and the second rear member.

15. An adjustable desktop workspace as claimed in claim 10 wherein the first lever and the second lever can fixedly engage the upper platform in a plurality of positions spaced from the base.

16. An adjustable desktop workspace as claimed in claim 1, the locking mechanism further comprising a first member biased into a position that locks the first set of arms into position; and a second member biased into a position that locks the second set of arms into position.

17. An adjustable desktop workspace as claimed in claim 1, further comprising:

a first mounting bracket extending below the upper platform, wherein the first set of arms is connected to the first mounting bracket; and

a second mounting bracket extending below the upper platform, wherein the second set of arms is connected to the second mounting bracket.

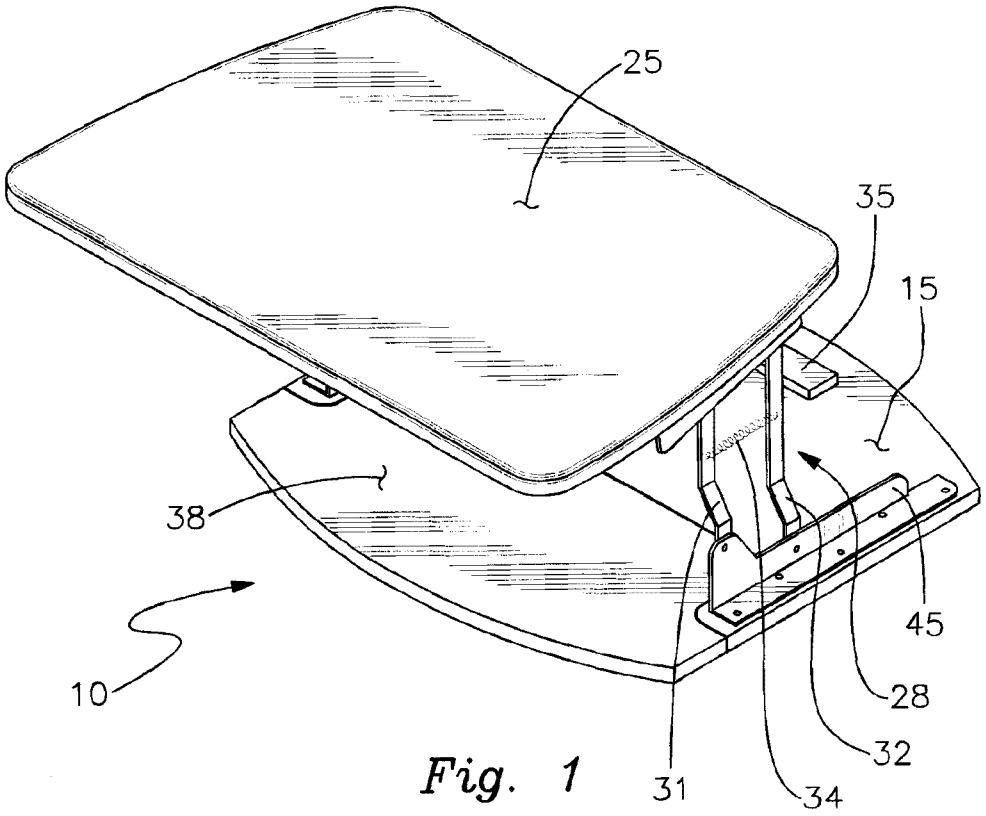


Fig. 1

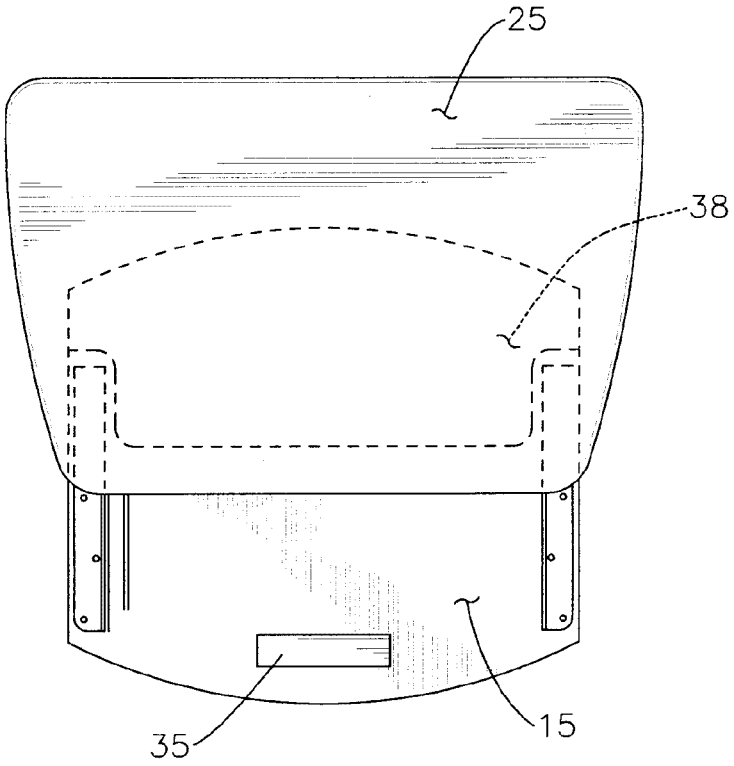


Fig. 2

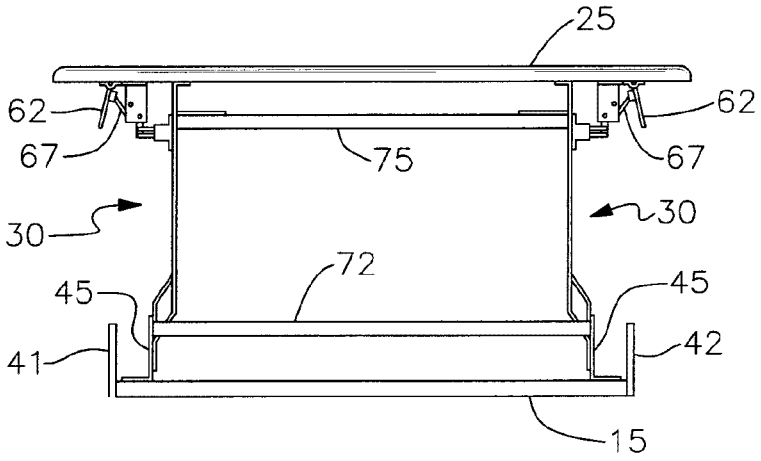


Fig. 3

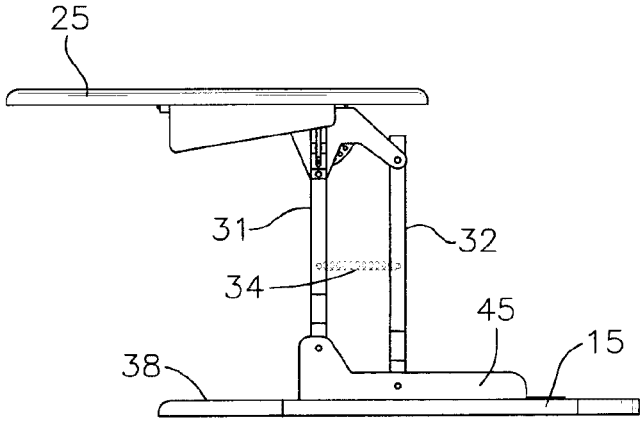


Fig. 4

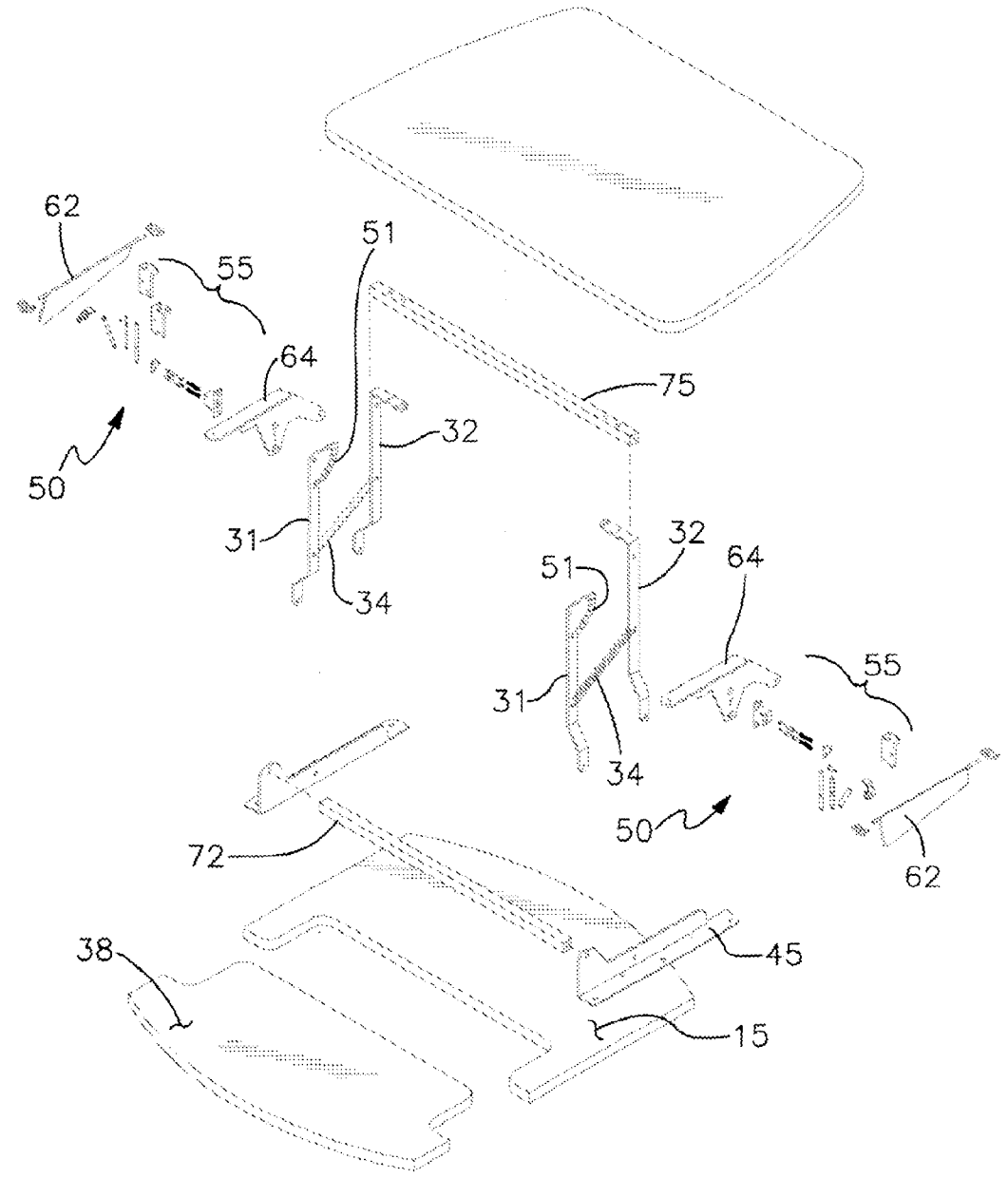
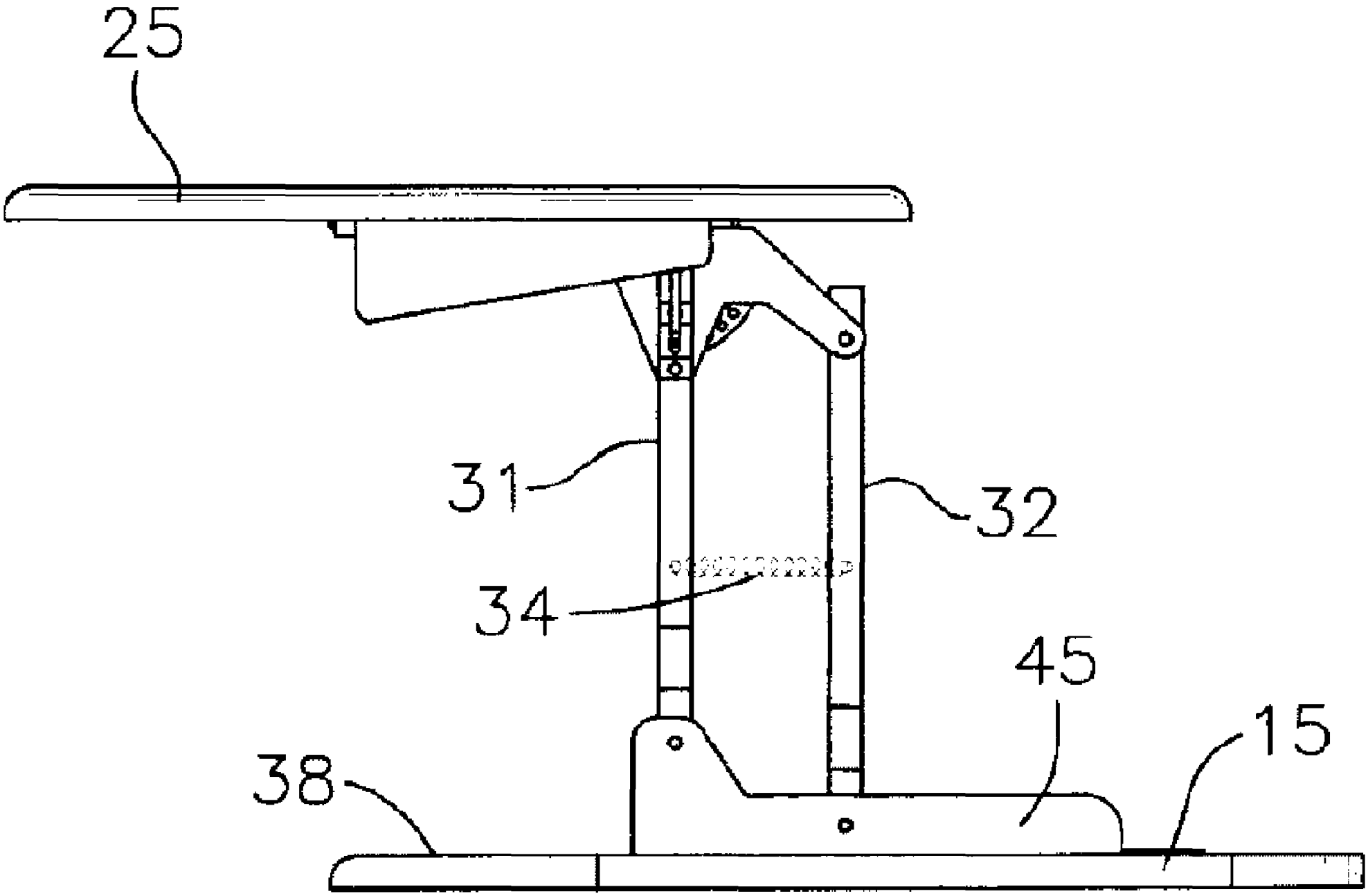


Fig. 5


25
31
32
34
45
15
38

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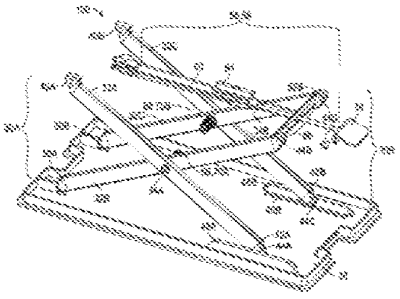
权利要求书2页 说明书11页 附图21页

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高度可调节装置

(57) 摘要

一种高度可调节装置可包括：基底；第一剪刀型连杆组合件，耦合到所述基底并具有第一剪刀型接点；第二剪刀型连杆组合件，耦合到所述基底并具有第二剪刀型接点；工作面，耦合到所述第一剪刀型连杆和所述第二剪刀型连杆；托架，可移动地耦合到所述第一剪刀型连杆和所述第二剪刀型连杆，并能够相对于所述工作面移动；以及第一储能部件，耦合到所述工作面并通过至少一个张力部件连接到所述托架，其中所述第一储能部件配置成使所述托架在水平方向上偏置。



CN 108024625 B

1.一种高度可调节装置,包括:

基底;

第一剪刀型连杆组合件,耦合到所述基底并具有第一剪刀型接点;

第二剪刀型连杆组合件,耦合到所述基底并具有第二剪刀型接点;

工作面,耦合到所述第一剪刀型连杆组合件和所述第二剪刀型连杆组合件;

托架,可移动地耦合到所述第一剪刀型连杆组合件和所述第二剪刀型连杆组合件,并能够相对于所述工作面移动;

包括气弹簧的第一储能部件,其中,所述第一储能部件耦合到所述工作面并通过至少一个张力部件连接到所述托架,其中,所述第一储能部件配置成提供水平拉力,以使所述托架在水平方向上偏置,且向所述工作面提供竖直提升力,其中:

所述气弹簧包括:

缸,其中,所述至少一个张力部件连接至所述缸;

相对于所述缸可移动的活塞,其中:

所述活塞延伸穿过所述托架中的孔口;

所述活塞与所述工作面耦合;以及

所述活塞配置成相对于所述托架和所述缸移动;以及

滑轮组合件,与所述第一储能部件耦合且能够沿水平方向在延伸配置和压缩配置之间移动,其中,所述至少一个张力部件与所述滑轮组合件接合。

2.根据权利要求1所述的高度可调节装置,进一步包括:

第二储能部件,定位于所述第一剪刀型接点和所述第二剪刀型接点中的一个处,所述第二储能部件配置成使所述工作面朝上偏置;且

其中所述第一储能部件和所述第二储能部件配置成在整个竖直高度调节范围中为所述高度可调节装置提供恒定提升力。

3.根据权利要求1所述的高度可调节装置,进一步包括:

第二储能部件,定位于所述第一剪刀型接点和所述第二剪刀型接点中的一个处,所述第二储能部件配置成使所述工作面朝上偏置。

4.根据权利要求3所述的高度可调节装置,其中所述第一储能部件和所述第二储能部件配置成在整个竖直高度调节范围中为所述高度可调节装置提供恒定提升力。

5.根据权利要求1到4中任一项所述的高度可调节装置,其中所述至少一个张力部件是柔性的。

6.根据权利要求1到4中任一项所述的高度可调节装置,进一步包括耦合到所述工作面且以可滑动方式耦合到所述缸的底座部件,其中:

所述至少一个张力部件包括具有柔性部分的第一张力部件,其中所述柔性部分在第一端和第二端之间延伸;

第一张力部件的所述第一端耦合到所述底座部件;

第一张力部件的所述第二端耦合到所述托架;以及

第一张力部件的所述柔性部分与所述滑轮组合件接合。

7.根据权利要求1到4中任一项所述的高度可调节装置,其中还包括靠近于所述活塞定位的手柄,其中所述手柄配置成与所述活塞接合,以锁定或解锁所述活塞相对于所述缸和

所述托架的移动。

8.根据权利要求1到4中任一项所述的高度可调节装置，其中，所述活塞相对于所述缸的移动相应地相对于所述活塞移动所述托架。

9.根据权利要求1到4中任一项所述的高度可调节装置，进一步包括耦合到所述工作面且以可滑动方式耦合到所述气弹簧的底座部件，其中，所述至少一个张力部件包括第一张力部件且所述滑轮组合件包含以可旋转方式接合第一张力部件的第一滑轮，所述第一张力部件连接所述托架与底座部件。

10.根据权利要求9所述的高度可调节装置，其中所述滑轮组合件包含以可旋转方式接合第二张力部件的第二滑轮，所述第二张力部件连接所述托架与所述底座部件。

11.根据权利要求2到4中任一项所述的高度可调节装置，其中所述第二储能部件是扭力弹簧。

12.根据权利要求1到4中任一项所述的高度可调节装置，其中所述第一剪刀型连杆组合件包含：

第一臂部件，可移动地耦合到所述基底；以及

第二臂部件，在所述第一剪刀型接点处耦合到所述第一臂部件，所述第二臂部件以可旋转方式耦合到所述基底；且

其中所述第二剪刀型连杆组合件包含：

第三臂部件，可移动地耦合到所述基底；以及

第四臂部件，在所述第二剪刀型接点处耦合到所述第三臂部件，所述第四臂部件以可旋转方式耦合到所述基底。

13.根据权利要求1到4中任一项所述的高度可调节装置，其中所述基底以U形状配置。

14.根据权利要求1到4中任一项所述的高度可调节装置，进一步包括耦合到所述托架和所述工作面且配置成使所述托架在水平方向上偏置的拉伸弹簧。

15.根据权利要求1到4中任一项所述的高度可调节装置，进一步包括附接到所述工作面的底部表面的罩壳托架，其中第一和第二剪刀型连杆组合件以可旋转方式附接到所述罩壳托架。

16.根据权利要求1到4中任一项所述的高度可调节装置，其中所述第一剪刀型连杆组合件包含配置成在所述基底上滚动的第一辊，且所述第二剪刀型连杆组合件包含配置成在所述基底上滚动的另一辊。

17.根据权利要求2到4中任一项所述的高度可调节装置，

其中所述第二储能部件是定位于所述第一剪刀型接点和所述第二剪刀型接点中的一个处的扭力弹簧，所述扭力弹簧配置成使所述工作面朝上偏置；且

其中所述气弹簧和所述扭力弹簧配置成在整个竖直高度调节范围中为所述高度可调节装置提供恒定提升力。

高度可调节装置

[0001] 优先权要求

[0002] 本专利申请要求Swartz等人于2015年9月24日提交的标题是“高度可调节装置(HEIGHT ADJUSTABLE DEVICE)”美国临时专利申请第62/232,133号(代理人案号5983.384PRV)的优先权,所述美国临时专利申请以全文引用的方式并入本文中。

技术领域

[0003] 本公开大体上涉及用于高度可调节装置的系统和方法。

背景技术

[0004] 高度可调节装置可用于桌、台、桌面单位、坐站应用或其它应用中。现有高度可调节工作面并不使用水平力制衡系统。

发明内容

[0005] 此外,本发明人已认识到,高度可调节装置可以经济的方式配置并在整个其竖直高度调节范围中具有恒定提升力。本公开提供用于高度可调节装置的独特系统和方法。本申请公开一种可包含储能部件的高度可调节装置,所述储能部件例如可作用于移动托架与工作面之间的水平力的锁定气弹簧。在所述高度可调节装置中,竖直提升力可随着剪刀型支腿臂更接近水平或降低位置移动而减小。为了抵消此减小的力,例如弹簧(扭转弹簧或等效物)等第二储能装置可例如在剪刀型支腿臂之间的连杆或接点处添加到剪刀型支腿,并可随着剪刀型支腿臂相对于彼此旋转而增大力。通过提供两个储能装置,一个配置成作用于旋转的剪刀型接点处的角向力,且一个配置成作用于移动托架处的水平力,可实现恒定的竖直提升力。所述高度可调节装置可在整个完整竖直行进范围中保持其上面放置的重量。

[0006] 出于本公开的目的,术语“桌”可包含任何类别的桌、台、工作面或显示面。“工作面”可包含任何大体上水平的表面,但不限于用于“工作”的表面。另外,所述高度可调节装置可配置成支撑可受益于可调高度的任何物品,且在此类状况下,所述物品可取代所述“工作面”。高度可调节装置可配置成可搁置于台或桌顶上的桌面单位,并可用以固持电脑、计算机系统、计算机监视器、笔记本电脑或笔记型电脑、工作面、工具、仪器或其它物品。高度可调节装置可配置成单独的台、桌或工作面,并可允许操作人员在站立或坐立位置中使用所述高度可调节装置。

[0007] 此概述意图提供对本专利申请的主题的概述。其并不意图提供对本发明的排它性或穷举性解释。包含具体实施方式以提供有关本专利申请的其它信息。在附图和以下描述中阐述本公开的一个或多个方面的细节。其它特征、目标和优势将从所述描述和图式以及从权利要求书而显而易见。

[0008] 为了进一步说明本文中所公开的高度可调节装置,在此处提供非限制性实例列表:

[0009] 在实例1中，一种高度可调节装置可包括：基底；第一剪刀型连杆组合件，耦合到所述基底并具有第一剪刀型接点；第二剪刀型连杆组合件，耦合到所述基底并具有第二剪刀型接点；工作面，耦合到第一剪刀型连杆和第二剪刀型连杆；托架，可移动地耦合到第一剪刀型连杆和第二剪刀型连杆，并可相对于所述工作面移动；以及第一储能部件，耦合到所述工作面并通过至少一个张力部件连接到所述托架，其中所述第一储能部件配置成使所述托架在水平方向上偏置。

[0010] 在实例2中，根据实例1所述的高度可调节装置可任选地配置成进一步包括：第二储能部件，所述第二储能部件定位于所述第一剪刀型接点和所述第二剪刀型接点中的一个处，所述第二储能部件配置成使所述工作面朝上偏置；且其中所述第一储能部件和所述第二储能部件配置成在整个竖直高度调节范围中为所述高度可调节装置提供恒定提升力。

[0011] 在实例3中，根据实例1到2中任一项或任一组合所述的高度可调节装置可任选地配置成进一步包括：定位于所述第一剪刀型接点和所述第二剪刀型接点中的一个处的第二储能部件，所述第二储能部件配置成使所述工作面朝上偏置。

[0012] 在实例4中，根据实例3所述的高度可调节装置可任选地配置成使得所述第一储能部件和所述第二储能部件配置成在整个竖直高度调节范围中为所述高度可调节装置提供恒定提升力。

[0013] 在实例5中，根据实例1到4中任一项或任一组合所述的高度可调节装置可任选地配置成使得所述第一储能部件是气弹簧。

[0014] 在实例6中，根据实例5所述的高度可调节装置可任选地配置成进一步包括：耦合到所述工作面且以可滑动方式耦合到所述气弹簧的底座部件。

[0015] 在实例7中，根据实例5所述的高度可调节装置可任选地配置成使得所述气弹簧包含配置成延伸穿过所述托架中的孔口的可移动活塞。

[0016] 在实例8中，根据实例5所述的高度可调节装置可任选地配置成进一步包括：耦合到所述气弹簧的滑轮组合件。

[0017] 在实例9中，根据实例8所述的高度可调节装置可任选地配置成使得所述滑轮组合件包含以可旋转方式啮合第一张力部件的第一滑轮，所述第一张力部件连接所述托架与所述底座部件。

[0018] 在实例10中，根据实例9所述的高度可调节装置可任选地配置成使得所述滑轮组合件包含以可旋转方式啮合第二张力部件的第二滑轮，所述第二张力部件连接所述托架与所述底座部件。

[0019] 在实例11中，根据实例2到10中任一项或任一组合所述的高度可调节装置可任选地配置成使得所述第二储能部件是扭力弹簧。

[0020] 在实例12中，根据实例1到11中任一项或任一组合所述的高度可调节装置可任选地配置成使得所述第一剪刀型连杆组合件包含：可移动地耦合到所述基底的第一臂部件；以及在所述第一剪刀型接点处耦合到所述第一臂部件的第二臂部件，所述第二臂部件以可旋转方式耦合到所述基底；且其中所述第二剪刀型连杆组合件包含：可移动地耦合到所述基底的第三臂部件；以及在所述第二剪刀型接点处耦合到所述第三臂部件的第四臂部件，所述第四臂部件以可旋转方式耦合到所述基底。

[0021] 在实例13中，根据实例1到12中任一项或任一组合所述的高度可调节装置可任选

地配置成使得所述基底以U形状配置。

[0022] 在实例14中，根据实例1到13中任一项或任一组合所述的高度可调节装置可任选地配置成进一步包括：拉伸弹簧，所述拉伸弹簧耦合到所述托架和所述工作面且配置成使所述托架在水平方向上偏置。

[0023] 在实例15中，根据实例1到14中任一项或任一组合所述的高度可调节装置可任选地配置成进一步包括：附接到所述工作面的底部表面的罩壳托架，其中第一和第二剪刀型连杆组合件以可旋转方式附接到所述罩壳托架。

[0024] 在实例16中，根据实例1到15中任一项或任一组合所述的高度可调节装置可任选地配置成使得：所述第一剪刀型连杆组合件包含配置成在所述基底上滚动的第一辊，且所述第一剪刀型连杆组合件包含配置成在所述基底上滚动的第二辊。

[0025] 在实例17中，根据实例1到16中任一项或任一组合所述的高度可调节装置可任选地配置成使得：所述第一储能部件是耦合到所述工作面、延伸穿过所述托架中的孔口且通过至少一个张力部件连接到所述托架的气弹簧，其中所述气弹簧配置成使所述托架在水平方向上偏置；其中所述第二储能部件是定位于所述第一剪刀型接点和所述第二剪刀型接点中的一个处的扭力弹簧，所述扭力弹簧配置成使所述工作面朝上偏置；且其中所述气弹簧和所述扭力弹簧配置成在整个竖直高度调节范围中为所述高度可调节装置提供恒定提升力。

[0026] 在实例18中，一种高度可调节装置可包括：基底；剪刀型连杆组合件，所述剪刀型连杆组合件包含：从第一端延伸到第二端的第一气弹簧组合件，所述第一端以可旋转方式耦合到所述基底；以及从第三端延伸到第四端的第二气弹簧组合件，所述第三端以可旋转方式耦合到所述基底；轴环组合件，所述轴环组合件具有以可滑动方式耦合到所述第一气弹簧组合件的第一轴环部分和以可滑动方式耦合到所述第二气弹簧组合件的第二轴环部分，所述第一轴环部分通过剪刀型接点以旋转方式耦合到所述第二轴环部分；以及在所述第二端和所述第四端处耦合到所述剪刀型连杆的工作面；其中所述剪刀型连杆配置成使所述工作面在竖直方向上偏置。

[0027] 在实例19中，根据实例18所述的高度可调节装置可任选地配置成进一步包括：扭力弹簧，所述扭力弹簧耦合于所述第一轴环部分与所述第二轴环部分之间，且配置成使所述工作面在竖直方向上偏置。

[0028] 在实例20中，根据实例18到19中任一项或任一组合所述的高度可调节装置可任选地配置成进一步包括：配置成解锁所述第一气弹簧组合件的第一气弹簧释放手柄，和配置成解锁所述第二气弹簧组合件的第二气弹簧释放手柄。

[0029] 在实例21中，根据实例1到20中任一项或任一组合所述的高度可调节装置可任选地配置成使得所叙述所有元件、操作或其它选项可用以使用或从中进行选择。

附图说明

[0030] 对应元件符号或文字描述贯穿若干视图指示对应部件。本文中阐明的例证说明本公开的示范性实例，并且此类例证不应被理解为以任何方式限制本公开的范围。

[0031] 图1说明根据本公开的至少一个实例的降低位置中的高度可调节装置的透视图。

[0032] 图2说明根据本公开的至少一个实例的升高位置中的高度可调节装置的透视图。

[0033] 图3说明根据本公开的至少一个实例的高度可调节装置的侧视图。

[0034] 图4说明根据本公开的至少一个实例的高度可调节装置的透视图。

[0035] 图5说明根据本公开的至少一个实例的高度可调节装置(移除了工作面)的透视图。

[0036] 图6说明根据本公开的至少一个实例的高度可调节装置(移除了工作面)的透视图。

[0037] 图7说明根据本公开的至少一个实例的高度可调节装置(具有透明工作面)的俯视图。

[0038] 图8说明根据本公开的至少一个实例的高度可调节装置的前视图。

[0039] 图9说明根据本公开的至少一个实例的图8的高度可调节装置的横截面侧视图。

[0040] 图10说明根据本公开的至少一个实例的高度可调节的透视图。

[0041] 图11说明根据本公开的至少一个实例的图10的高度可调节装置的透视图。

[0042] 图12说明根据本公开的至少一个实例的降低位置中的高度可调节装置(移除了工作面)的透视图。

[0043] 图13说明根据本公开的至少一个实例的高度可调节装置(移除了工作面)的俯视图。

[0044] 图14说明根据本公开的至少一个实例的高度可调节装置的前视图。

[0045] 图15说明根据本公开的至少一个实例的高度可调节装置100的透视图。

[0046] 图16说明根据本公开的至少一个实例的高度可调节装置(移除了工作面)的俯视图。

[0047] 图17说明根据本公开的至少一个实例的高度可调节装置200的透视图。

[0048] 图18说明根据本公开的至少一个实例的高度可调节装置200的透视图。

[0049] 图19说明根据本公开的至少一个实例的折叠配置中的高度可调节装置的透视图。

[0050] 图20说明根据本公开的至少一个实例的高度可调节装置的侧视图。

[0051] 图21说明根据本公开的至少一个实例的高度可调节装置的侧视图。

具体实施方式

[0052] 图1说明根据本公开的至少一个实例的降低位置20中的高度可调节装置100的透视图。高度可调节装置100可配置成可实现坐或站操作的桌面平台。高度可调节装置100可定位于桌22上,并可在工作面26上支撑例如电子装置24等物品。桌22可以是台、桌、架或其它类型的家具。桌22可包含桌面27。桌面27可以是台面、桌面、工作面或其它类型的平台。高度可调节装置100可配置成桌面平台,并可以是立式的或永久地附接到桌面27。

[0053] 图2说明根据本公开的至少一个实例的升高位置28中的高度可调节装置100的透视图。升高位置28可允许在站立位置处工作。工作面26可由第一剪刀型连杆组合件30A和第二剪刀型连杆组合件30B支撑。第一剪刀型连杆组合件30A和第二剪刀型连杆组合件30B可提供剪裁动作以有助于升高和降低高度可调节装置100。

[0054] 图3说明根据本公开的至少一个实例的高度可调节装置100的侧视图。第一剪刀型连杆组合件30A可包含第一臂部件32A,第一臂部件32A可在第一剪刀型接点34A处以旋转方式耦合到第二臂部件32B。第一剪刀型连杆组合件30A和第二剪刀型连杆组合件30B可耦合

到基底36(也见图4)。当工作面26朝下25移动,例如移动成更接近基底36时,第一臂部件32A的下端可更接近29A基底36的右侧水平地移动。当工作面26降低时,第二臂部件32B的上端可更接近29B工作面26的右侧水平地移动。当工作面26升高时,第一臂部件32A的端与第二臂部件32B的端可在相对方向上移动。

[0055] 图4说明根据本公开的至少一个实例的高度可调节装置100的透视图。高度可调节装置100可至少包含如上文所描述的第一剪刀型连杆组合件30A。高度可调节装置100可包含第二剪刀型连杆组合件30B。工作面26和基底36可耦合到第一剪刀型连杆组合件30A和第二剪刀型连杆组合件30B。在本申请中,剪刀型支腿组件还可被称作剪刀型提升机构或剪裁连杆。第二剪刀型连杆组合件30B可包含第三臂部件32C和第四臂部件32D。第三臂部件32C与第四臂部件32D可通过可旋转连接件在其中间区域附近耦合在一起,可旋转连接件例如第二剪刀型接点34B。基底36可以是平面的。基底可以是矩形的、弯曲的或具有弯曲部分与直部分的组合。高度可调节装置100可包含将在下文更详细地描述的气弹簧释放手柄38。

[0056] 图5说明根据本公开的至少一个实例的高度可调节装置100的透视图。移除工作面26(见图4)以展示其它组件。第一剪刀型连杆组合件30A可包含第一臂部件32A和第二臂部件32B。第一臂部件32A可在第一上接点40A处可移动地耦合到工作面26。第一上接点40A可以是销接点、铰链或可允许第一臂部件32A相对于工作面26旋转的任何类型的接点。第一臂部件32A可在第一下滚动/滑动接点42A处可移动地耦合到基底36。第一下滚动/滑动接点42A可以是任何类型的有轨、开槽、带轮或可允许第一臂部件32A相对于基底36水平且旋转地移动的其它接点连接。第一下滚动/滑动接点42A可包含元件,例如可沿着基底36滚动/滑动的第一辊44A。第一辊44A可在基底36上运动,并可允许第一臂部件32A的第二端在平行于基底36的长度的直线路径中移动。第一轨46A(见图7)可形成于基底36中以引导下滚动元件。第一引导部件48A可沿着第一下滚动/滑动接点42A的一侧定位,并可引导第一臂部件32A或第一辊44A中的一个或两个。

[0057] 第二臂部件32B可在第一下接点50A处可移动地耦合到工作面26。第一下接点50A可以是销接点、铰链或可允许第二臂部件32B相对于基底36旋转的任何类型的接点。第二臂部件32B可在第一上滚动/滑动接点52A处可移动地耦合到工作面26。第一上滚动/滑动接点52A可以是任何类型的有轨、开槽、带轮或可允许第二臂部件32B相对于工作面26水平且旋转地移动的其它接点连接。第一上滚动/滑动接点52A可包含元件,例如可沿着工作面26的底部表面54滚动/滑动的第二辊44B(见图8)。第二辊44B可允许第二臂部件32B的第二端在平行于工作面26的长度的直线路径中移动。

[0058] 第二剪刀型连杆组合件30B可包含第三臂部件32C和第四臂部件32D。第三臂部件32C可在第二上接点40B处可移动地耦合到工作面26。第二上接点40B可以是销接点、铰链或可允许第三臂部件32C相对于工作面26旋转的任何类型的接点。第三臂部件32C可在第二下接点42B处可移动地耦合到基底36。第二下滚动/滑动接点42B可以是任何类型的有轨、开槽、带轮或可允许第三臂部件32C相对于基底36水平且旋转地移动的其它接点连接。第二下滚动/滑动接点42B可包含元件,例如可沿着基底36滚动/滑动的第三辊44C。第三辊44C可在基底36上运动,并可允许第三臂部件32C的第二端在平行于基底36的长度的直线路径中移动。第一轨46B可形成于基底36中以引导下滚动元件。第二引导部件48B可沿着第二下滚动/滑动接点42B的一侧定位,并可引导第三臂部件32C或第三辊44C中的一个或两个。

[0059] 第四臂部件32D可在第二下接点50B处可移动地耦合到工作面26。第二下接点50B可以是销接点、铰链或可允许第四臂部件32D相对于基底36旋转的任何类型的接点。第四臂部件32D可在第二上滚动/滑动接点52B处可移动地耦合到工作面26。第二上滚动/滑动接点52B可以是任何类型的有轨、开槽、带轮或可允许第四臂部件32D相对于工作面26水平且旋转地移动的其它接点连接。第二上滚动/滑动接点52B可包含元件，例如可沿着工作面26的底部表面54滚动/滑动的第四辊44D。第四辊44D可允许第四臂部件32D的第二端在平行于工作面26的长度的直线路径中移动。在一些实例配置中，第一辊44A、第二44B辊、第三辊44C或第四辊44D中的任一个或全部可被滑动元件、滑动销或滑件替换。

[0060] 第一储能部件56可定位于工作面26下面。第一储能部件56可以是气弹簧、一个或多个弹性部件，例如拉伸弹簧或弹性带、或先前提到的装置中的任一个的组合。在本申请中，第一储能部件56还可被称作气弹簧58。气弹簧58可包含气弹簧缸60和气弹簧活塞62。气弹簧活塞62可从气弹簧缸60延伸并收缩。气弹簧58可由气弹簧底座64在工作面26下面稳定。气弹簧底座64可塑形成适配于气弹簧58的全部或部分周围并配置成支撑气弹簧58。气弹簧底座64可耦合到工作面26，且气弹簧58/气弹簧缸60可在气弹簧底座64内滑动。

[0061] 第二臂部件32B和第四臂部件32D可耦合到移动托架66(还可被称为“托架”)。在实例中，第二臂部件32B和第四臂部件32D可以旋转方式附接到移动托架66。移动托架66可相对于工作面26水平地移动。气弹簧活塞62可啮合气弹簧释放手柄38，气弹簧释放手柄38可配置成解锁气弹簧58。展示为第一扭力弹簧70A和第二扭力弹簧70B中的任一个或两个的第二储能部件68可定位于第一剪刀型接点34A和第二剪刀型接点34B中的一个或两个处。第二储能部件68可以是扭力弹簧、或配置成辅助或抵消第一剪刀型接点34A和/或第二剪刀型接点34B处的扭矩相关力的任何类型的储能装置。第二储能部件68可用以辅助重量制衡。因为在第一剪刀型接点34A和第二剪刀型接点34B处第一扭力弹簧70A可与第一臂部件32A和第二臂部件32B接触和/或第二扭力弹簧70B可与第三臂部件32C和第四臂部件32D接触，所以当高度可调节装置升高或降低时，第二储能部件68可产生制衡力。

[0062] 本申请完全涵盖的是，在另一实例中，基底36上的第一下滚动/滑动接点42A和第二下滚动/滑动接点42B可与工作面26的第一上滚动/滑动接点52A和第二上滚动/滑动接点52B处于高度可调节装置100的相对端上。此配置将也适用于第一下接点50A和第二下接点50B与第一上接点40A和第二上接点40B。

[0063] 图6说明根据本公开的至少一个实例的高度可调节装置100(移除了工作面)的透视图。气弹簧底座64可耦合到工作面26的底部表面54(见图9)。第一附接部件72A(见图11)和第二附接部件72B可耦合到气弹簧底座64或成形到气弹簧底座64中，并可有助于将第一张力部件74A和第二张力部件74B附接到气弹簧底座64。第一附接部件72A和第二附接部件72B可以是钩、突出元件、孔口、夹钳、压线套、或将张力部件附接到托架的任何其它构件。在本申请中，第一张力部件74A和第二张力部件74B可包含装置，例如绳、线缆、拎带、链、或软线或前述元件的组合。在另一实例中，第一张力部件74A和第二张力部件74B可耦合到工作面26(见图4)。气弹簧活塞62可在一端上以可滑动方式与气弹簧缸60啮合，并可在另一端上耦合到工作面26。释放销(未展示)可定位于气弹簧活塞62的尖端处，同时接近附接到工作面26(见图9)。通常，气弹簧58可始终锁定。

[0064] 当需要调节工作面26的高度时，可挤压气弹簧释放手柄38；定位于气弹簧释放手

柄38上的突片可按压释放销，并解锁气弹簧58。在解锁了气弹簧58的情况下，用户可调节工作面26的高度。移动托架66可在第一上滚动/滑动接点52A处以旋转方式与第二臂部件32B耦合，并可在第二上滚动/滑动接点52B处以旋转方式与第四臂部件32D耦合。孔口76可界定于移动托架66的中间附近。气弹簧活塞62可延伸并滑动穿过孔口76。

[0065] 滑轮组合件78可耦合到气弹簧缸60的一端。滑轮组合件78可包含滑轮固持托架80、第一滑轮82A和第二滑轮82B。第一滑轮82A和第二滑轮82B可以旋转方式与滑轮固持托架80啮合。第一滑轮82A与第二滑轮82B可定位于相同轴线上，但它们可独立于彼此旋转。第一张力部件74A可在其第一端上耦合到第一附接部件72A(见图12)，可布设于第一滑轮82A周围，并可在其第二端上耦合到移动托架66。第二张力部件74B可在其第一端上耦合到第二附接部件72B，可布设于第二滑轮82B周围，并可在其第二端上耦合到移动托架66。

[0066] 图7说明根据本公开的至少一个实例的高度可调节装置100的俯视图。工作面26展示为透明的以显示在其下面的其它组件。第一轨46A和第二轨46B可成形到基底36中以引导下滚动元件，例如第一辊44A和第三辊44C。当工作面26升高或降低时，可允许气弹簧缸60在气弹簧底座64内滑动。气弹簧58可使高度可调节装置100朝向升高位置28偏置(见图2)。第一张力部件74A和第二张力部件74B可耦合到移动托架66。移动托架66可以旋转方式耦合到第二臂部件32B和第四臂部件32D。在气弹簧活塞62的末端展示气弹簧释放销84。气弹簧释放销84可在由气弹簧释放手柄38致动时解锁气弹簧58。

[0067] 图8说明根据本公开的至少一个实例的高度可调节装置100的前视图。第二储能部件68可定位于第一剪刀型接点34A和第二剪刀型接点34B中的一个或两个处。如上所述，第二储能部件68可以是第一扭力弹簧70A和/或第二扭力弹簧70B。第一扭力弹簧70A的主部分可定位到第二臂部件32B右边。第二扭力弹簧70B的主部分可定位到第四臂部件32D左边。扭力弹簧轴线86可与第一剪刀型接点34A和第二剪刀型接点34B的轴线一致。每个扭力弹簧的第一支腿可连接到臂中的一个，且每个扭力弹簧的第二支腿可连接到另一个臂。在实例中，扭力弹簧可定位于剪刀型接点的任一侧上，或剪刀型接点的臂之间(见图11到12)。底部表面54可为第一臂部件32A和第三臂部件32C的第一上接点40A和第二上接点40B提供附接点。

[0068] 图9说明根据本公开的至少一个实例的图8的高度可调节装置100的横截面侧视图。当工作面26朝下25移动时，水平面向的臂角度91(以及装置的其它角度——出于说明的目的而使用此角度)可减小，且因此，第二扭力弹簧70B上的张力可增大。第二扭力弹簧70B的张力可致使扭矩92在第三臂部件32C和第四臂部件32D上增大，并可使第四辊44D朝向第二剪刀型接点34B的中心94(在水平方向上)偏置。当工作面26朝下25移动时，水平面向的臂角度91可减小，且第四辊44D可从第二剪刀型接点34B的中心94移开。因此，移动托架66也可从第二剪刀型接点34B的中心94移开。因为第一张力部件74A和第二张力部件74B的一端固定地附接到移动托架66，所以第一张力部件74A和第二张力部件74B的另一端耦合到气弹簧底座64；第一张力部件74A和第二张力部件74B可拉上气弹簧缸60，并可致使气弹簧58上的张力增大。气弹簧58可将增大的水平拉力96施加到移动托架66上，并可使移动托架66朝向第二剪刀型接点34B的中心94偏置。当水平面向的臂角度91在工作面26朝下25移动时减小时，由气弹簧58产生的第一竖直提升力97也可减小。但是，同时扭矩92和由第二扭力弹簧70B施加到第二剪刀型连杆组合件30B上的第二竖直提升力98可增大。因此，由高度可调节装置100提供的总提升力99可保持恒定。取决于实例配置(不管存在一个还是两个扭力弹

簧)，先前描述的动作中的一些或全部将在第一剪刀型连杆组合件30A上同时进行(见图8)。

[0069] 基底36可包含平面下水平部件88，升高的竖直部件90可在水平部件88上一体化或附接。下辊可在平面下水平部件88上运动，和/或由第一轨46A和第二轨46B引导(见图7)。

[0070] 在高度可调节装置100的额外实例中，可针对高度可调节装置100设计成支撑的任何重量而校准第一储能部件56和第二储能部件68，例如气弹簧58，或第一扭力弹簧70A和第二扭力弹簧70B。可设计/校准储能部件以提供用于升高或降低高度可调节装置的更强或更弱的偏置力。储能部件可配备有张力/弹簧力调节。底部表面54可为气弹簧底座64和气弹簧58提供附接点。

[0071] 图10说明根据本公开的至少一个实例的高度可调节装置101的透视图。在实例中，基底36可以U形状102配置，U形状102可在地板或桌面表面上在水平位置中排布。U形状102的中间部分104可包含用于第一剪刀型连杆组合件30A的第二臂部件32B的第一可旋转附接点106A，且U形状102的第一端108A可提供用于第一剪刀型连杆组合件30A的第一臂部件32A的滑动或滚动附接的第一轨146A。

[0072] U形状102的中间部分104可包含用于第二剪刀型连杆组合件30B的第四臂部件32D的第二可旋转附接点106B，且U形状102的第二端108BA可提供用于第二剪刀型连杆组合件30B的第三臂部件32C的滑动或滚动附接的第二轨146B。高度可调节装置101可包含气弹簧(见图12)。第一扭力弹簧70A和第二扭力弹簧70B可用以辅助重量制衡来升高、降低或支撑工作面26。

[0073] 图11说明根据本公开的至少一个实例的图10的高度可调节装置101的透视图。在图11中，移除工作面26以展示下方的其它组件。罩壳托架110可耦合到工作面26的底部表面54(见图8)。罩壳托架110可从托架第一端112延伸到托架第二端114。通道部分116可提供可收纳气弹簧58、滑轮组合件78和气弹簧底座64的深度118(也见图14)。在托架第一端112处，罩壳托架110可包含可为第一上接点40A和第二上接点40B提供附接点的第一延伸部件120A和第二延伸部件120B。罩壳托架110可包含用于第一上滚动/滑动接点52A和第二上滚动/滑动接点52B的第一狭槽122A和第二狭槽122B。第一狭槽122A和第二狭槽122B可配置成狭槽、轨道、引导件或可引导第一上滚动/滑动接点52A和第二上滚动/滑动接点52B和/或移动托架66的水平移动的类似配置。

[0074] 第一扭力弹簧70A说明为定位于第一剪刀型接点34A处。扭力弹簧可定位于每个剪刀型接点中。本实例的工作原理可与上文解释的实例相同。气弹簧活塞62展示为在延伸位置124中。在延伸位置124中，当与图12中展示的压缩位置126的从第一附接部件72A和第二附接部件72B到滑轮组合件78的第一张力部件74A和第二张力部件74B的相同片段比较时，从第一附接部件72A和第二附接部件72B到滑轮组合件78的第一张力部件74A和第二张力部件74B的片段是长的。返回到图11，在延伸位置124中，滑轮组合件78已延伸远离气弹簧底座64。因为气弹簧58通过第一张力部件74A和第二张力部件74B连接到移动托架66并被允许在气弹簧底座64中滑动，所以气弹簧长度改变的量可不同于移动托架66从延伸位置124移动到压缩位置126的水平长度。在实例中，气弹簧长度改变可以是移动托架66移动的水平长度两倍。

[0075] 图12说明根据本公开的至少一个实例的降低位置20中的高度可调节装置101(移除了工作面)的透视图。高度可调节装置101展示为在降低位置20中，同时第一剪刀型连杆

组合件30A和第二剪刀型连杆组合件30B折叠。气弹簧58展示为在压缩位置126中。相比于图11中展示的延伸位置124，滑轮组合件78已移动成更接近气弹簧底座64。返回到图12，通道部分116可足够窄以套合于第二臂部件32B与第四臂部件32D之间。第一延伸部件120A和第二延伸部件120B可搁置于第一剪刀型连杆组合件30A和第二剪刀型连杆组合件30B顶上(同时附接到工作面26的底部表面54，见图8)。罩壳托架110可包含用作到工作面26的额外附接点的第一侧凸缘130A和第二侧凸缘130B。

[0076] 图13说明根据本公开的至少一个实例的高度可调节装置101(移除了工作面)的俯视图。第一张力部件74A和第二张力部件74B可在一端处连接到移动托架66，在滑轮组合件78周围延伸，并接着在另一端处连接到气弹簧底座64上的第一附接部件72A和第二附接部件72B。气弹簧58能够是可在气弹簧底座64内移动的。气弹簧底座64可耦合到罩壳托架110。

[0077] 图14说明根据本公开的至少一个实例的高度可调节装置101的前视图。在实例中，第一扭力弹簧70A可安装于第一臂部件32A第二臂部件32B之间。在实例中，第二扭力弹簧70B可安装于第三臂部件32C与第四臂部件32D之间。展示了通道部分116的深度118。

[0078] 图15说明根据本公开的至少一个实例的高度可调节装置100的透视图。第一拉伸弹簧132A和第二拉伸弹簧132B可安装于移动托架66与工作面26之间的。在另一实例中，第一拉伸弹簧132A和第二拉伸弹簧132B可安装于移动托架66与罩壳托架110之间(见图12)。在一些配置中，可借助于至少一个拉伸弹簧提供提升力。一个或多个扭力弹簧可用以辅助重量制衡。第二扭力弹簧70B展示为定位于第二剪刀型接点34B处。扭力弹簧还可用以补充提升力。还可包含配置成锁定和解锁的气弹簧58，以能够锁定/解锁和提升/降低高度可调节装置100。可按压气弹簧释放手柄38以解锁气弹簧58。

[0079] 图16说明根据本公开的至少一个实例的高度可调节装置100的俯视图。第一拉伸弹簧132A和第二拉伸弹簧132B可定位于工作面26下面(见图15)。可使用一个或多个拉伸弹簧。第一拉伸弹簧132A和第二拉伸弹簧132B的一端可固定地附接到工作面26。第一拉伸弹簧132A和第二拉伸弹簧132B的另一端可固定地附接到移动托架66。拉伸弹簧可使移动托架66朝向第一剪刀型接点34A和第二剪刀型接点34B的中心(在水平方向上)偏置。

[0080] 移动托架66可平行于工作面26移动，如在先前章节中所解释。当工作面26朝下移动到更低位置时，移动托架66从移开第一剪刀型接点34A和第二剪刀型接点34B的中心，并可增大可以是细长的第一拉伸弹簧132A和第二拉伸弹簧132B上的张力。另外，第一扭力弹簧70A和第二扭力弹簧70B可定位于第一剪刀型接点34A和第二剪刀型接点34B处。由拉伸弹簧和扭力弹簧提供的提升力彼此补充，如在先前章节中所解释。所得提升力可恒定。

[0081] 气弹簧缸60可固定地附接到移动托架66。气弹簧活塞62可以可滑动方式与气弹簧缸60啮合并耦合到工作面26。气弹簧活塞62的尖端可与气弹簧释放手柄38接触。气弹簧释放销84(见图7)可定位于气弹簧活塞62的尖端处。通常，气弹簧58始终锁定。当需要调节工作面的高度时，气弹簧释放手柄38可致动；定位于气弹簧释放手柄38上的突片按压到气弹簧释放销84上，并可解锁气弹簧58。用户可继续调节高度可调节装置100的高度水平。

[0082] 图17说明根据本公开的至少一个实例的高度可调节装置200的透视图。高度可调节装置200可包含基底236、工作面226和剪刀型连杆组合件230。剪刀型连杆组合件230可包含可在轴环组合件235处的剪刀型接点233中连接的第一气弹簧组合件231A与第二气弹簧组合件231B。第一气弹簧组合件231A和第二气弹簧组合件231B可各自包含气弹簧和外盖。

[0083] 图18说明根据本公开的至少一个实例的高度可调节装置200的透视图。为了清晰起见未展示工作面226。第一气弹簧组合件231A可包含第一上旋转部件237A和第一上固定部件239A(可能在两个部分中)。工作面26(见图18)可耦合到第一上固定部件239A。第一上旋转部件237A可定位于第一上固定部件239A的两个部分之间,并可在高度可调节装置100升高和降低时相对于第一上固定部件239A旋转。第二气弹簧组合件231B可包含第二上旋转部件237B和第二上固定部件239B(可能在两个部分中)。工作面26可耦合到第二上固定部件239B。第二上旋转部件237B可定位于第二上固定部件239B的两个部分之间,并可在高度可调节装置200升高和降低时相对于第二上固定部件239B旋转。

[0084] 第一气弹簧组合件231A可包含第一下旋转部件241A和第一下固定部件243A(可能在两个部分中)。基底36可耦合到第一下固定部件243A。第一下旋转部件241A可定位于第一下固定部件243A的两个部分之间,并可在高度可调节装置升高和降低时相对于第一下固定部件243A旋转。第二气弹簧组合件231B可包含第二下旋转部件241B和第二下固定部件243B(可能在两个部分中)。基底236可耦合到第二下固定部件243B。第二下旋转部件241B可位于第一下固定部件243A的两个部分之间,并可在高度可调节装置200升高和降低时相对于第二下固定部件243B旋转。

[0085] 图19说明根据本公开的至少一个实例的折叠配置228中的高度可调节装置200的透视图。高度可调节装置200可包含剪刀型连杆组合件230。工作面226制作成透明的以显示在其下面的组件。在折叠配置228中,第一气弹簧组合件231A和第二气弹簧组合件231B展示为在压缩位置227中。

[0086] 图20说明根据本公开的至少一个实例的高度可调节装置200的侧视图。高度可调节装置200可包含工作面226和基底236。第一气弹簧组合件231A可包含外部覆盖物,例如第一伸缩盖245A。第二气弹簧组合件231B可包含外部覆盖物,例如第二伸缩盖245B。第一伸缩盖245A和第二伸缩盖245B可隐藏或保护气弹簧(见图21)。高度可调节装置200可包含轴环组合件235,所述轴环组合件235具有可以可滑动方式与第一气弹簧组合件231A啮合的第一轴环部分247A和可以可滑动方式与第二气弹簧组合件231B啮合的第二轴环部分247B。第一轴环部分247A与第二轴环部分247B可在剪刀型接点233处以可旋转方式彼此耦合,并可包含连接到第一轴环部分247A和第二轴环部分247B的扭力弹簧。

[0087] 图21说明根据本公开的至少一个实例的包含剪刀型连杆组合件230的高度可调节装置200的侧视图。以横截面展示第一气弹簧组合件231A。第一伸缩盖245A可包含具有第一气弹簧缸260和第一气弹簧活塞262的第一气弹簧258。气弹簧活塞262可以可滑动方式与气弹簧缸260啮合。气弹簧缸260的下端可固定地附接到第一下旋转部件241A。气弹簧活塞262的上端可固定地附接到第一上旋转部件237A。

[0088] 释放销284可定位于在右边接近第一气弹簧释放手柄238A,例如在所述手柄下方的气弹簧活塞262的上端上。通常可锁定第一气弹簧258A和第二体弹簧(盖下的258B),并因此可停用任何高度调节。当第一气弹簧释放手柄238A和第二气弹簧释放手柄238B致动或挤压时,定位于每个手柄上的突片可按压释放销并可解锁气弹簧。用户可通过推下工作面226或允许其上升来调节工作面226的高度。第二气弹簧组合件231B可包含类似内部元件。本文中所提供的实例中的任一个可配置有变化的气弹簧、扭力弹簧或拉伸弹簧强度以支撑需要的任何负载。

[0089] 提供了调节桌或工作面的方法。通过在剪刀型接点和定位于工作面下的第一储能部件处为高度可调节装置提供扭力弹簧，可实现恒定竖直提升力，且高度可调节装置可跨完整竖直行进范围固持其上面放置的重量。扭力弹簧或第二储能部件可配置成作用于剪刀型接点处的角运动，同时第一储能部件，例如气弹簧或拉伸弹簧，配置成作用于移动托架与工作面之间的水平运动。

[0090] 这些非限制性实例中的每一个可以独立存在，或可以各种排列或组合与其它实例中的一个或多个组合。

[0091] 以上详细描述包含对附图的参考，所述附图形成所述详细描述的一部分。所述图式借助于说明展示可实践本发明的特定实施例。这些实施例在本文中还被称作“实例”。此类实例可包含除了所展示或所描述的那些元件之外的元件。但是，本发明人还预期仅提供所展示或描述的那些元件的实例。此外，本公开的发明人还预期使用相对于特定实例(或其一个或多个方面)或相对于本文展示或描述的其它实例(或其一个或多个方面)而展示或描述的那些元件的任何组合或排列的实例(或其一个或多个方面)。

[0092] 如果本文件与通过引用方式并入的任何文件之间发生不一致的用途，以本文件的用途为准。

[0093] 以上描述预期为说明性的而非限制性的。例如上述实例(或其一个或多个方面)可以彼此组合使用。例如一般技术者在查阅以上描述后可使用其它实施例。另外，在以上具体实施方式中，可将各种特征分组在一起以简化本公开。不应将此情况解释为期望未要求的公开特征对任何权利要求来说是必需的。实际上，本发明主题可在于比特定揭示实施例的所有特征要少。因此，所附权利要求书特此作为实例或实施例并入具体实施方式中，其中每个权利要求作为单独实施例单独存在，且预期此类实施例可彼此组合成各种组合或排列。应参考所附权利要求书以及此权利要求书所授予的等效物的完整范围决定本发明的范围。

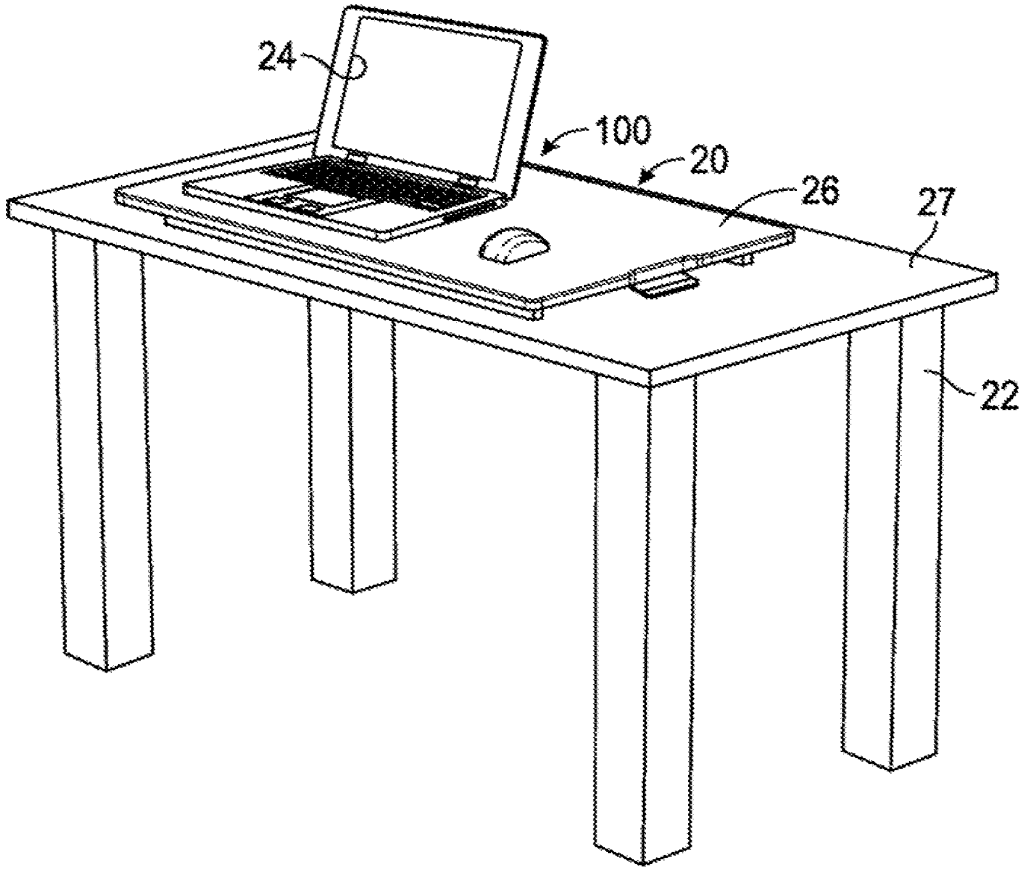


图1

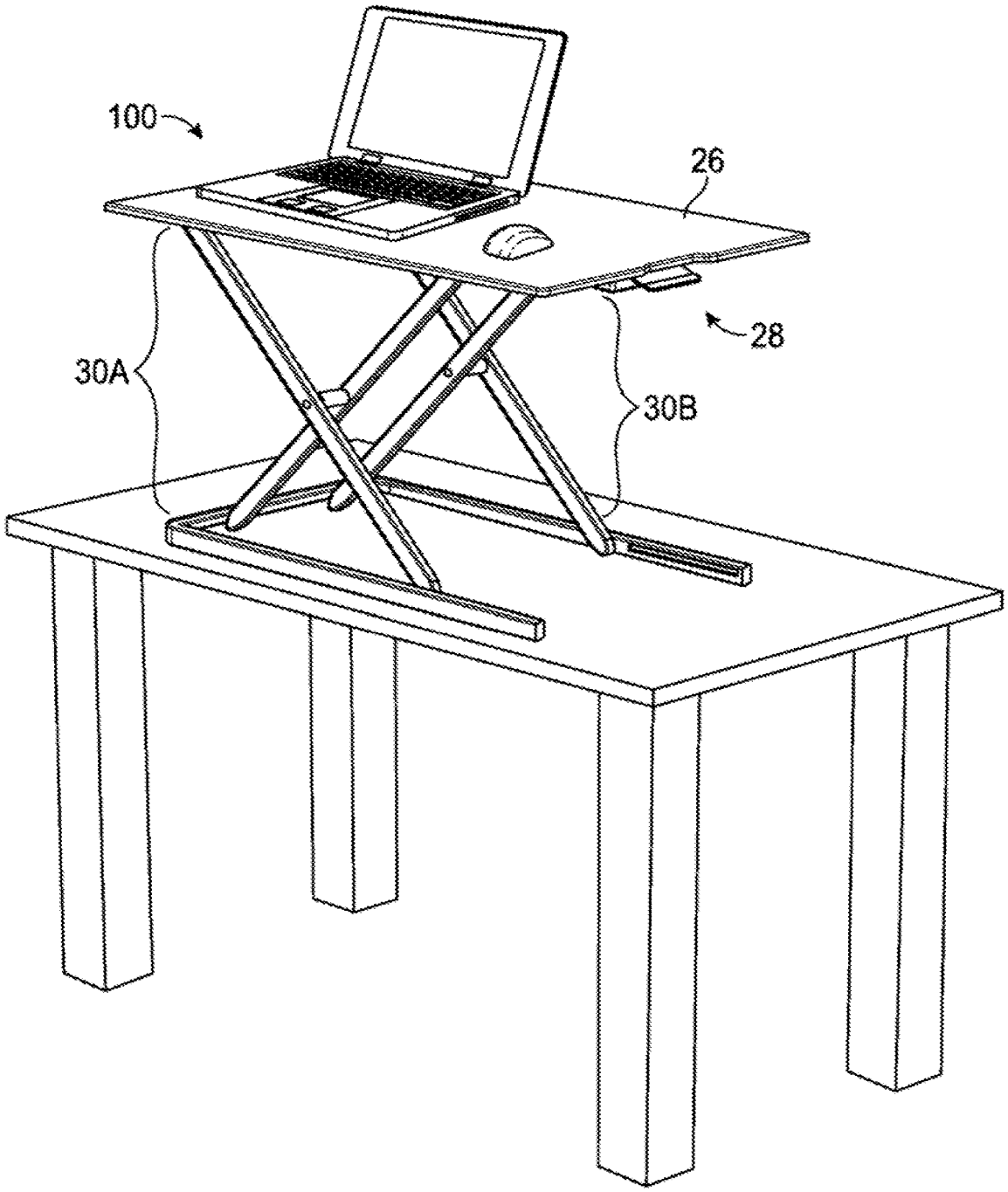


图2

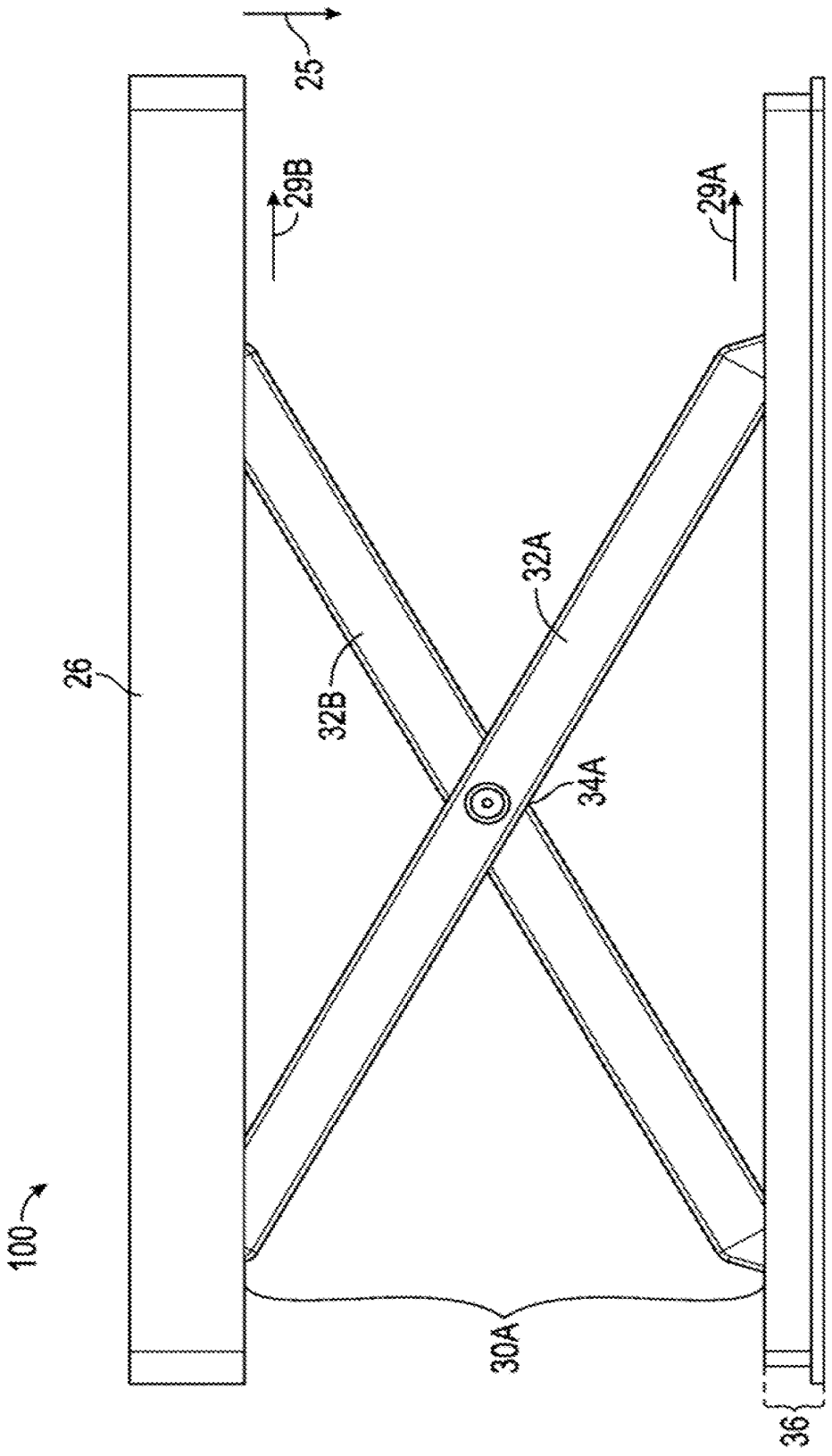


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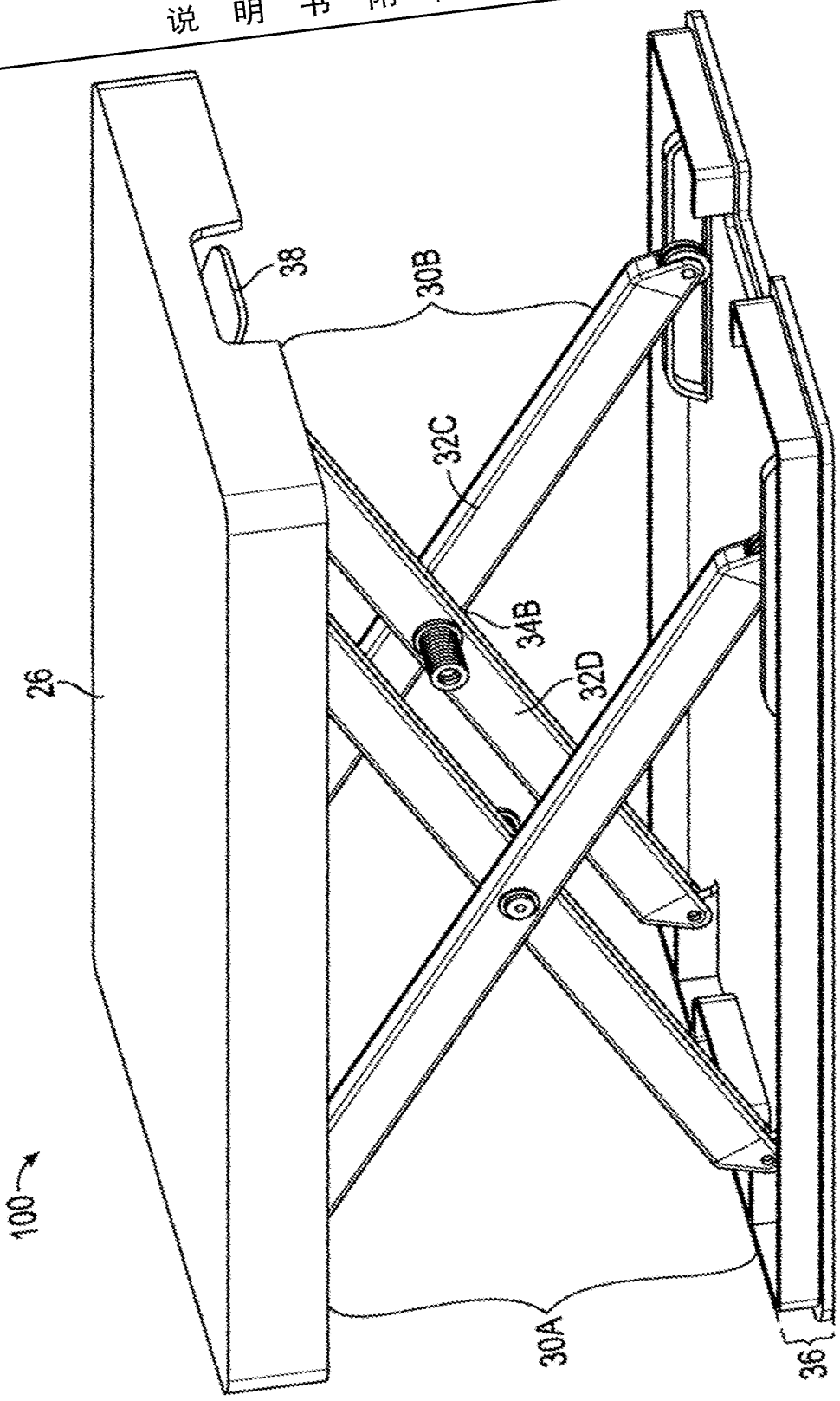


图4

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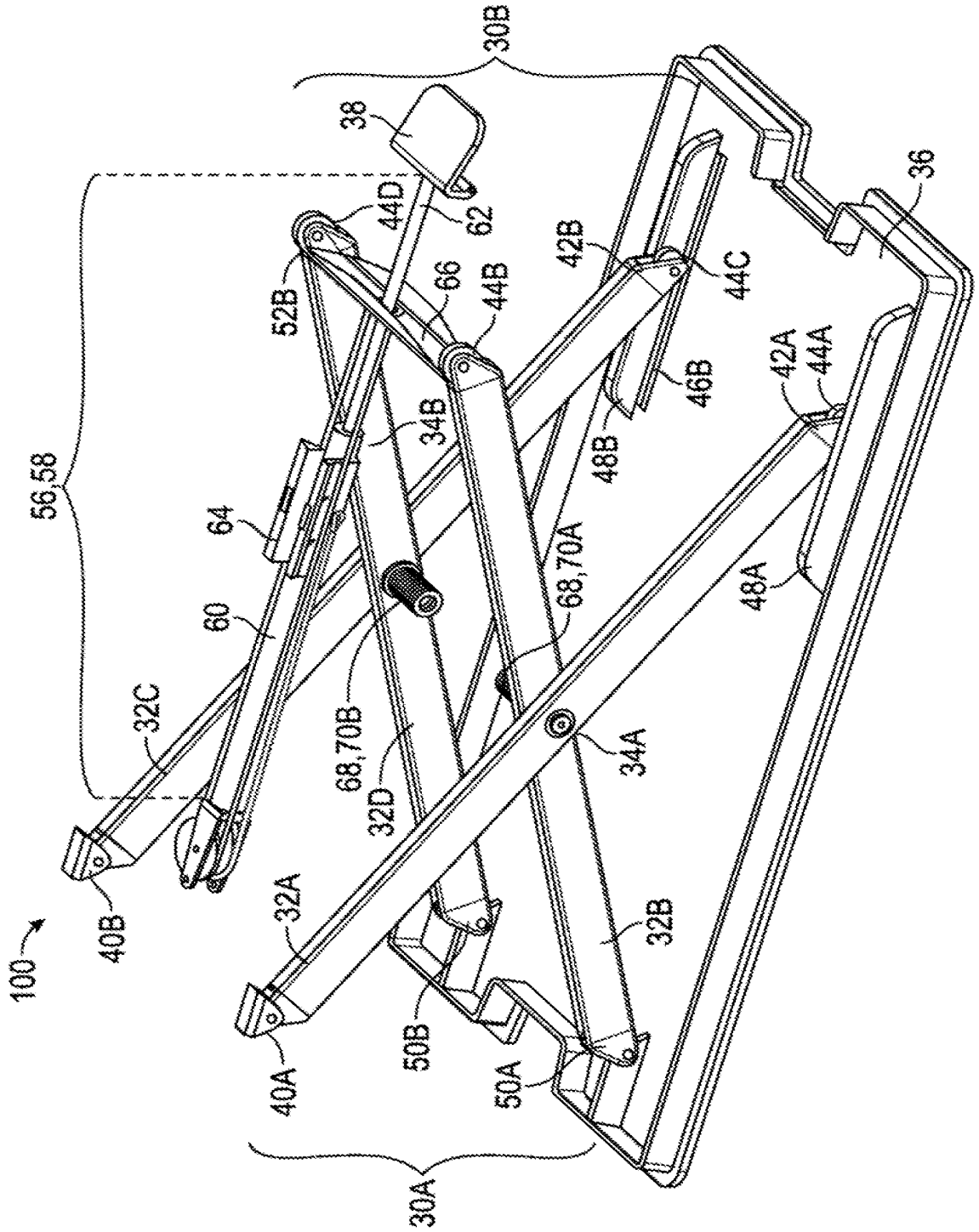


图5

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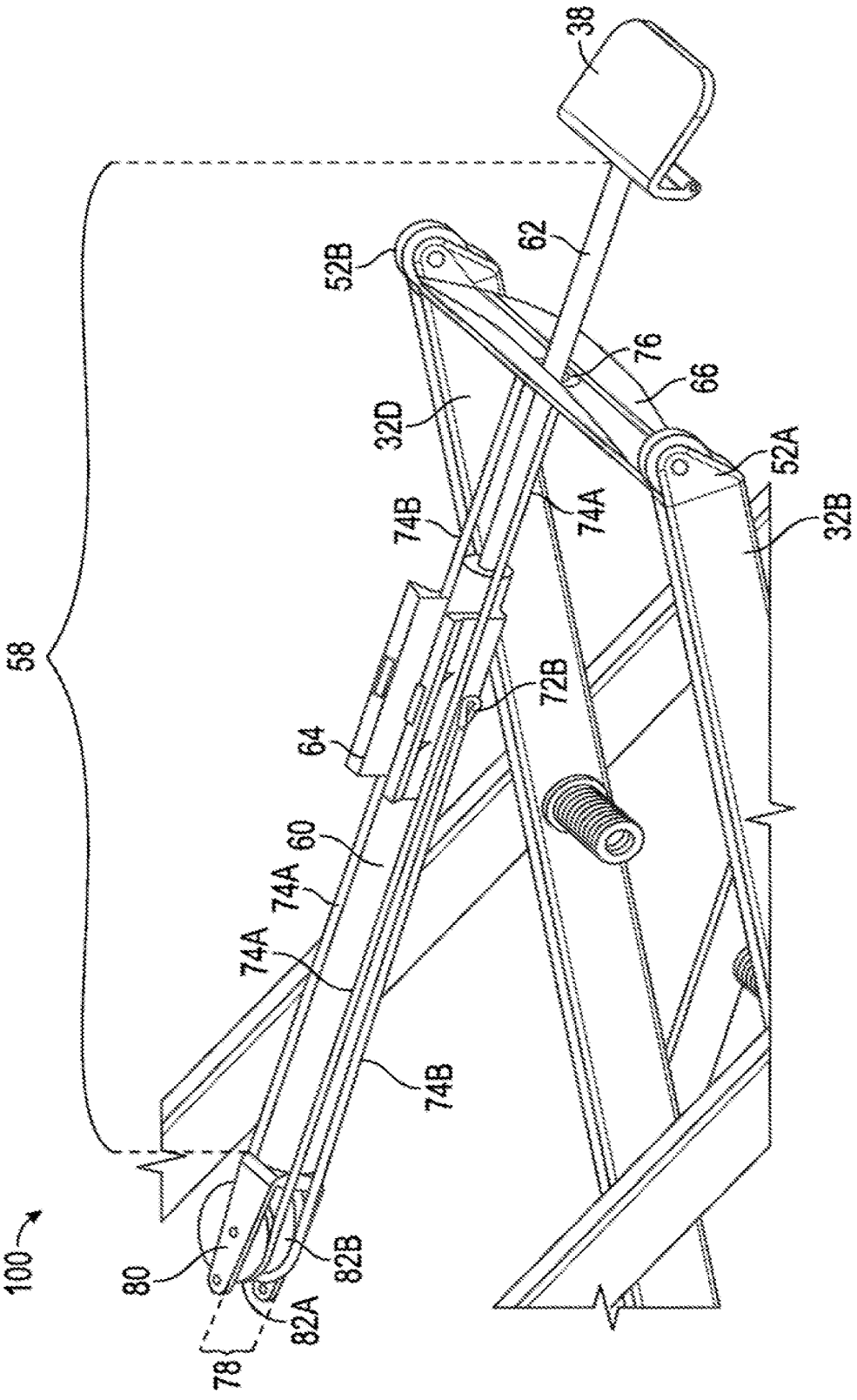


图6

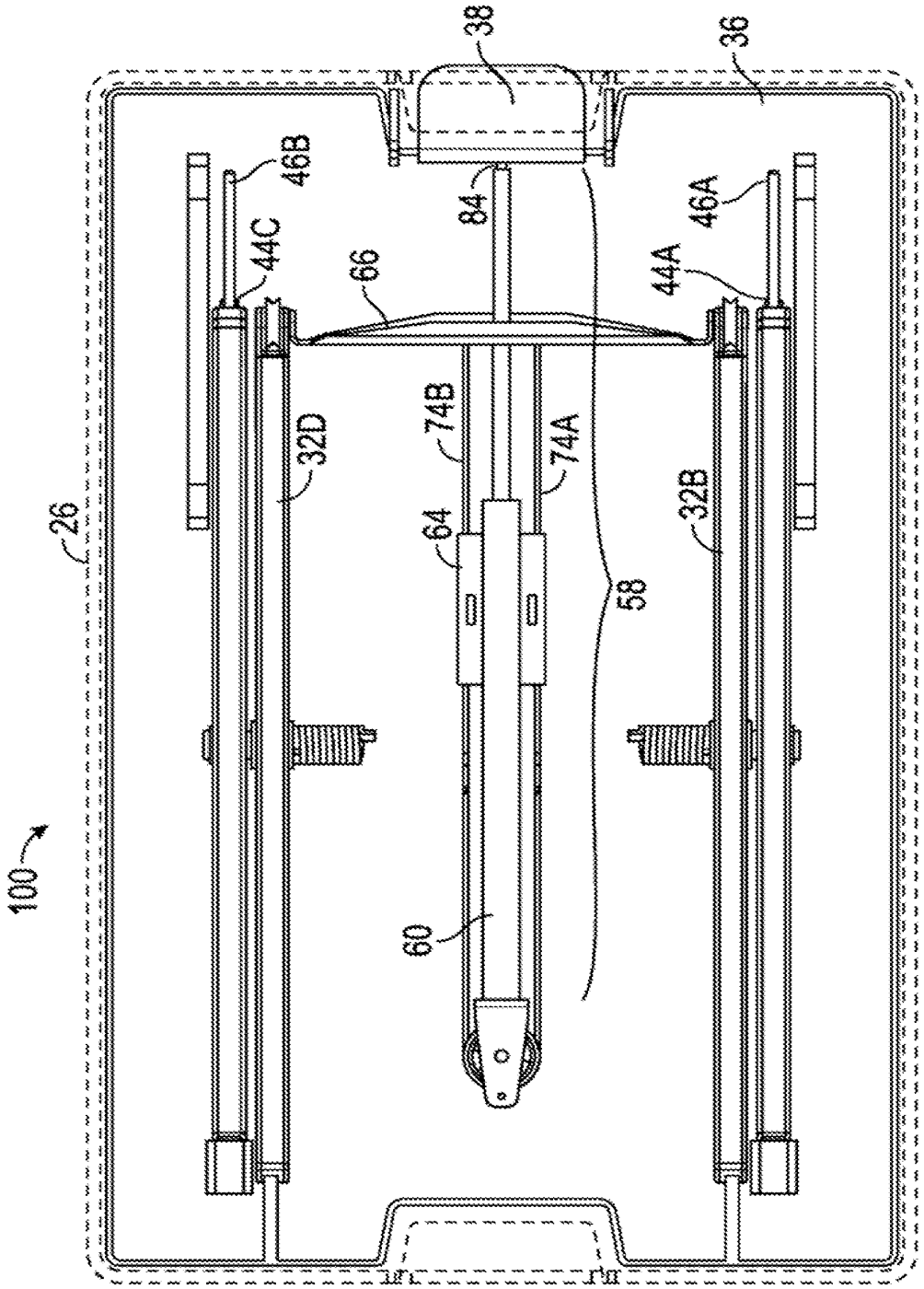


图7

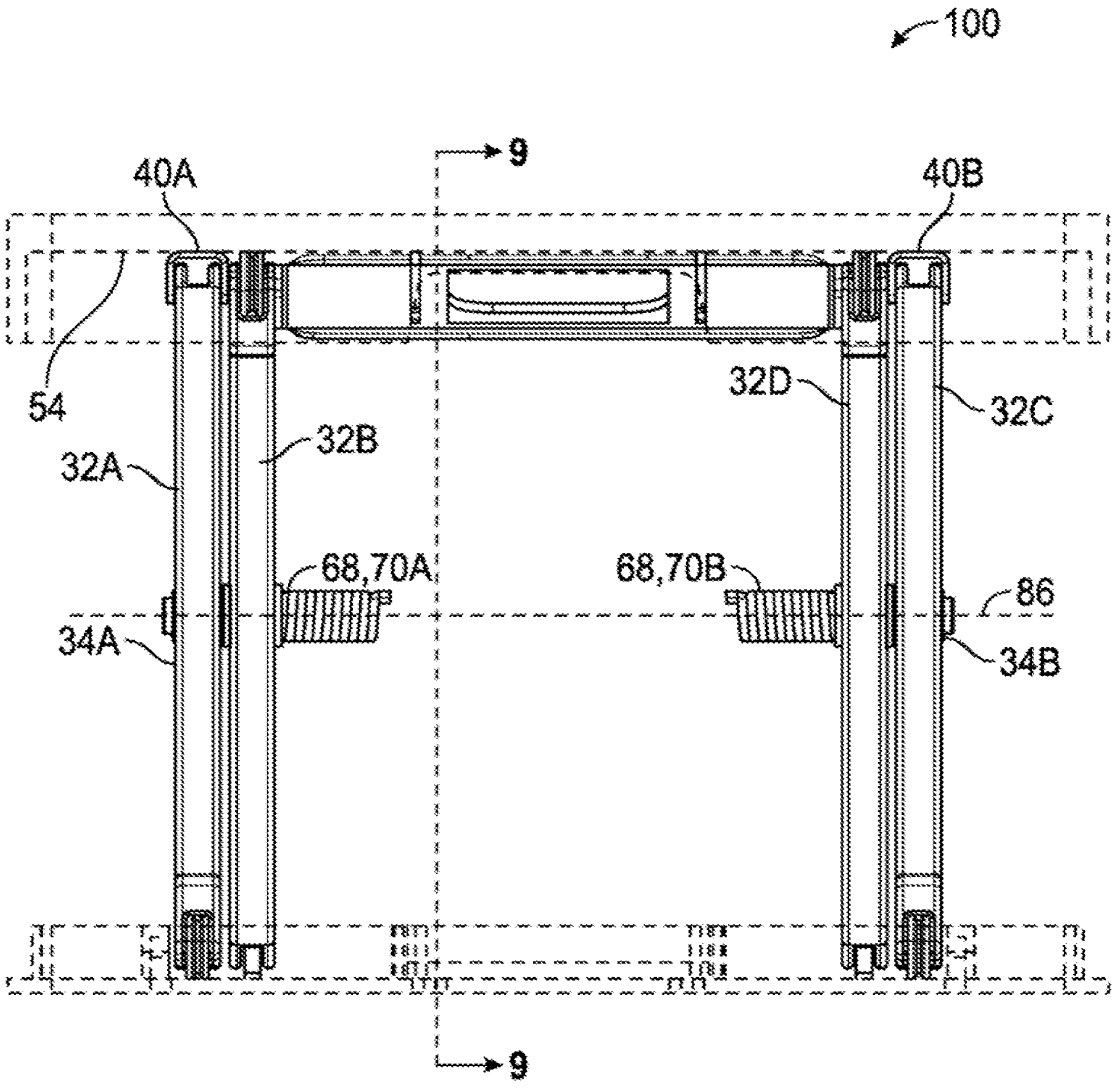


图8

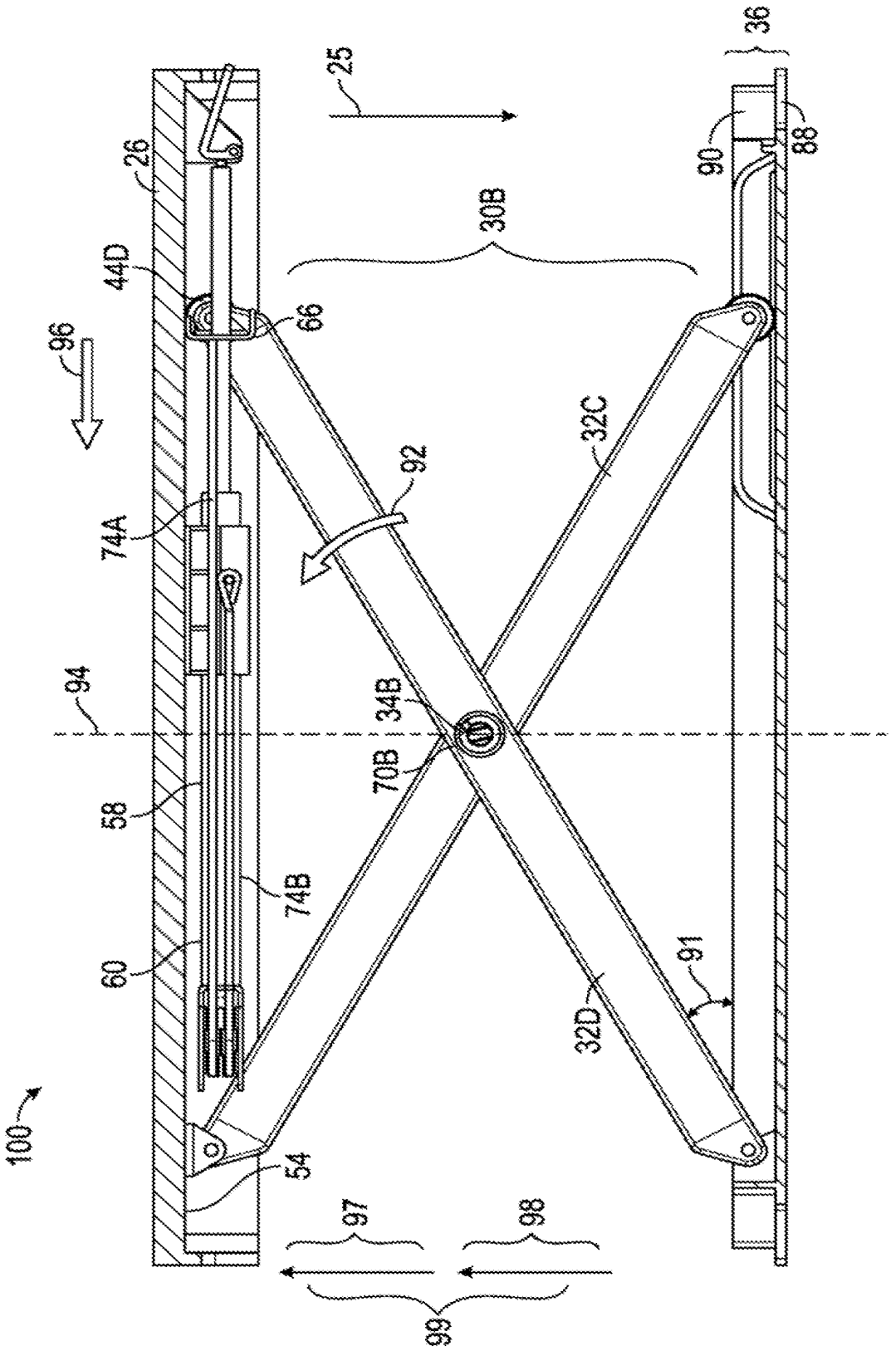

36
25
26
90
88
30B
44D
66
96
32C
92
74A
94
34B
70B
58
74B
60
91
32D
100
54
97
98
99

图9

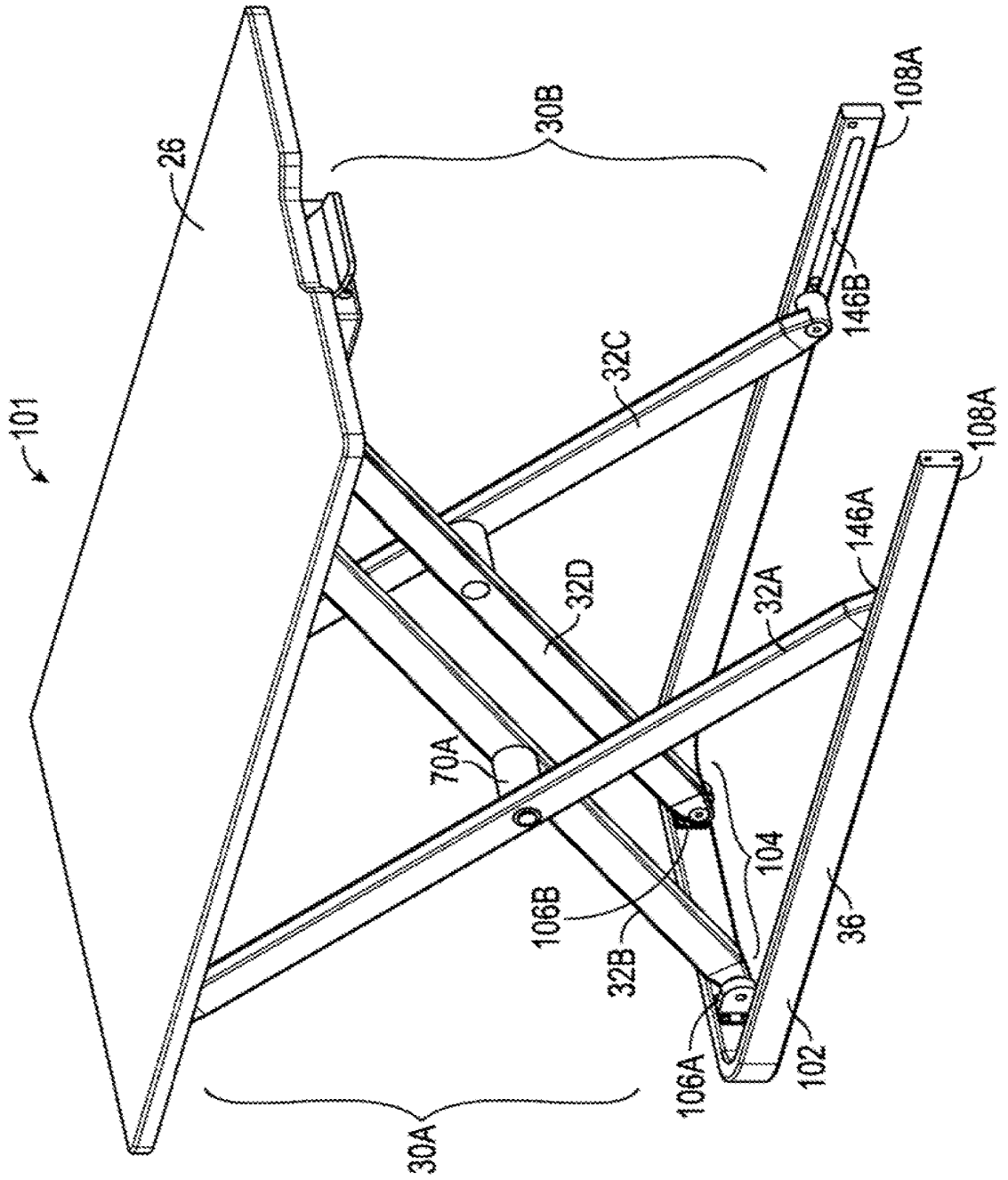

101
26
30B
108A
146B
32C
108A
146A
32D
32A
70A
104
106B
36
32B
106A
102
30A

图10

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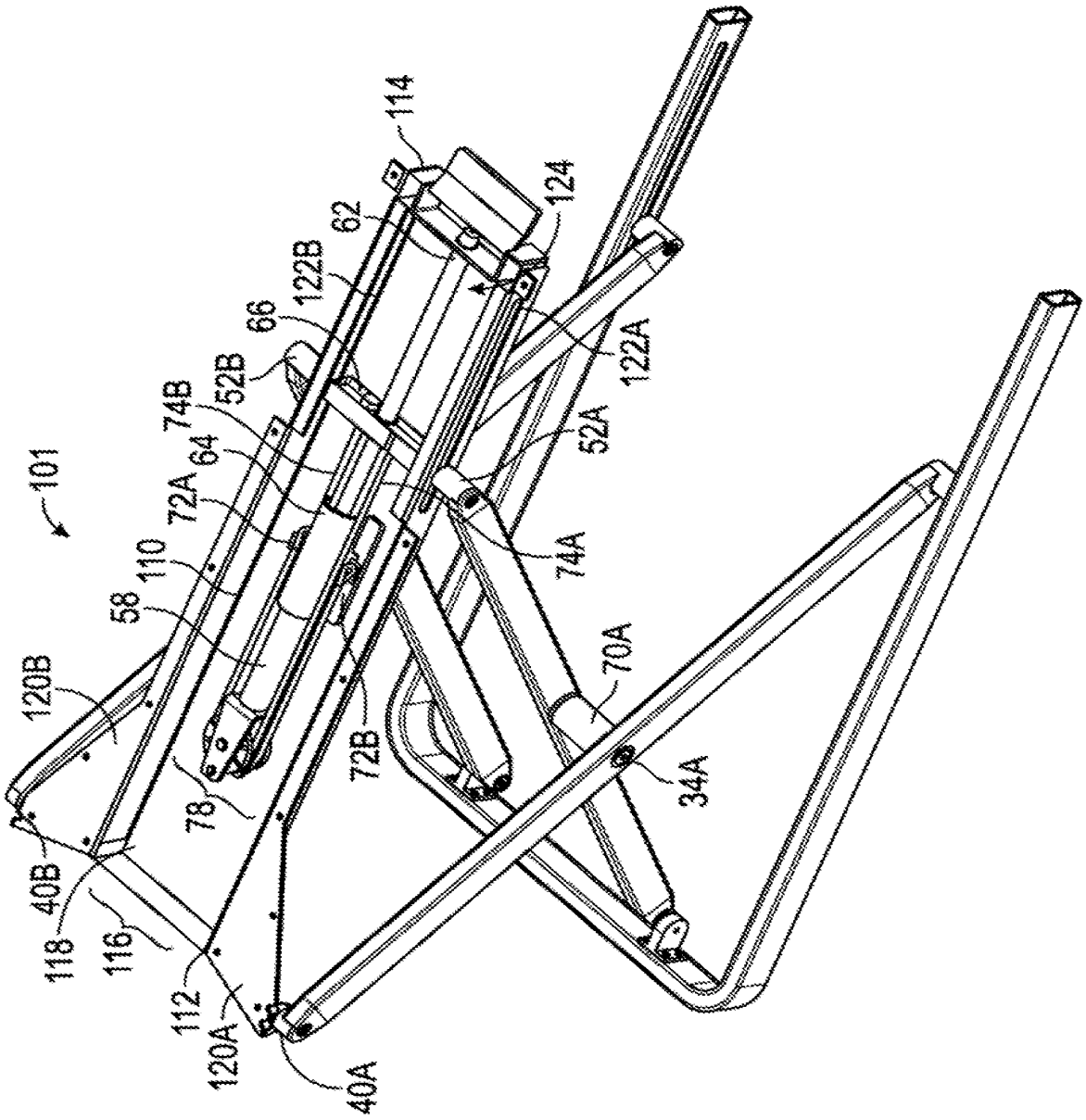


图11

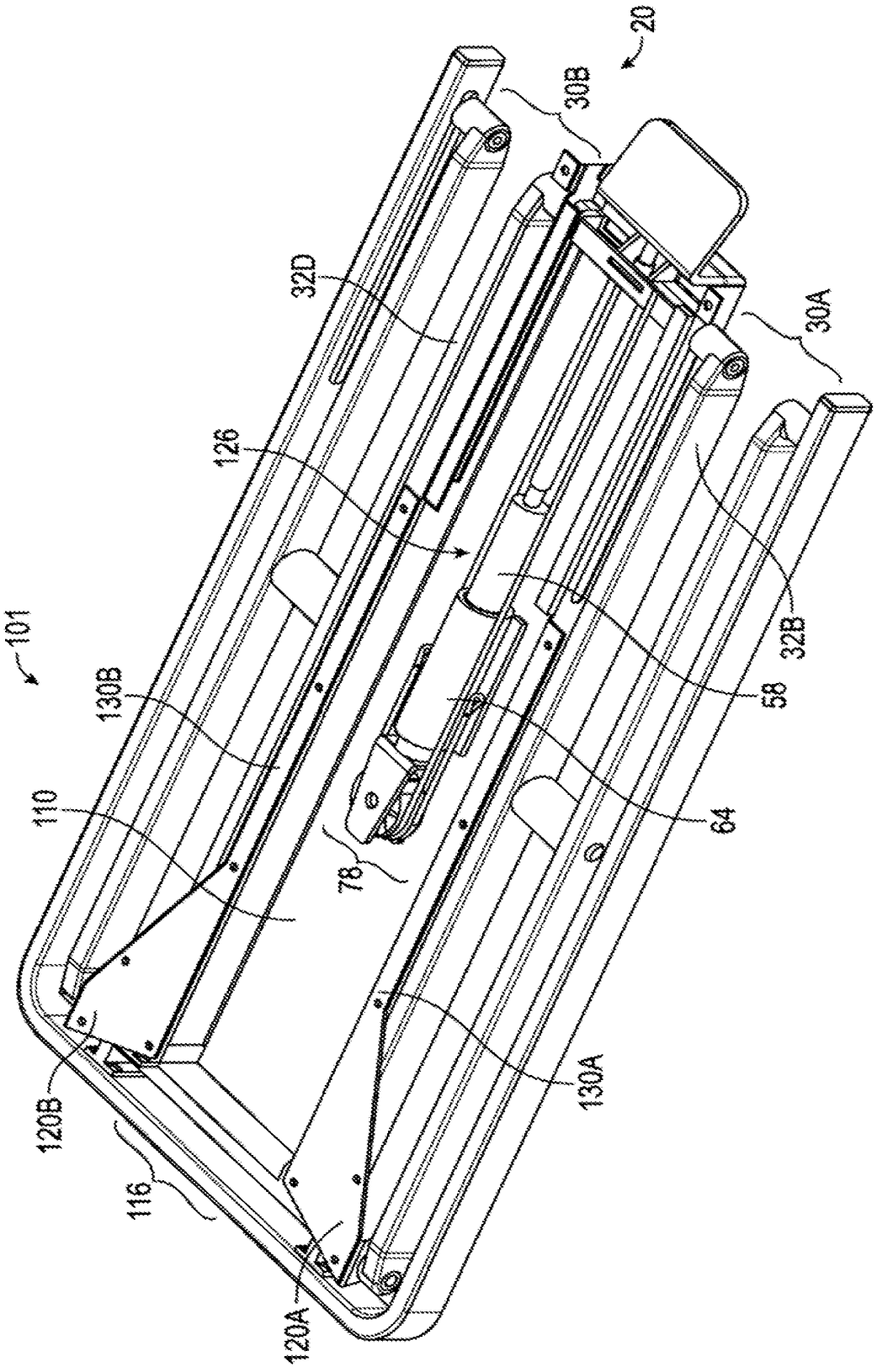


图12

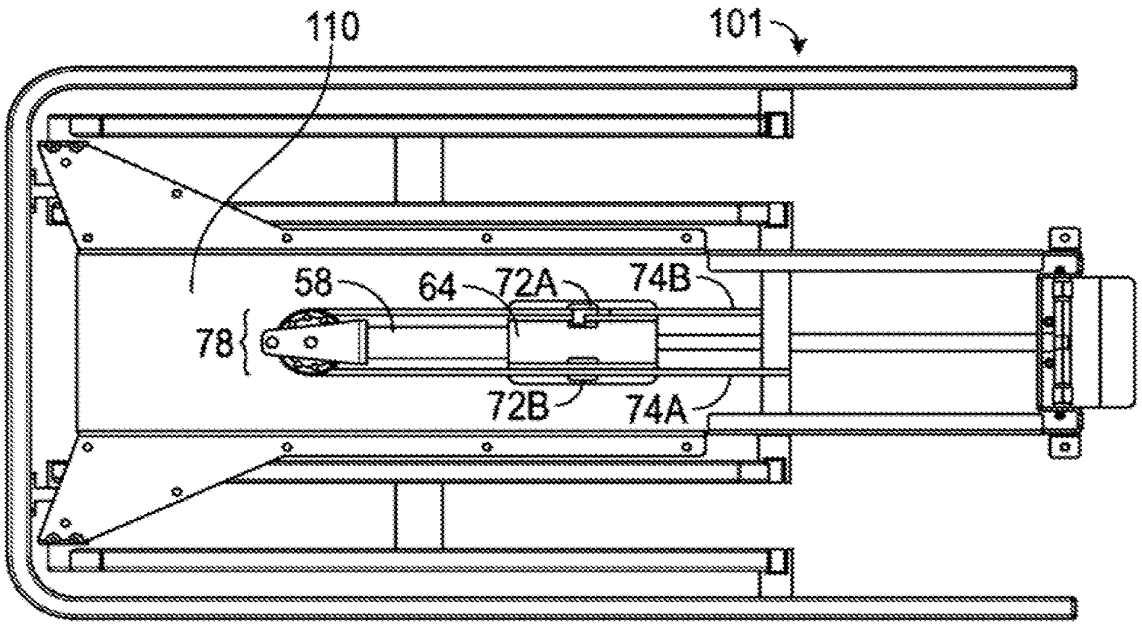


图13

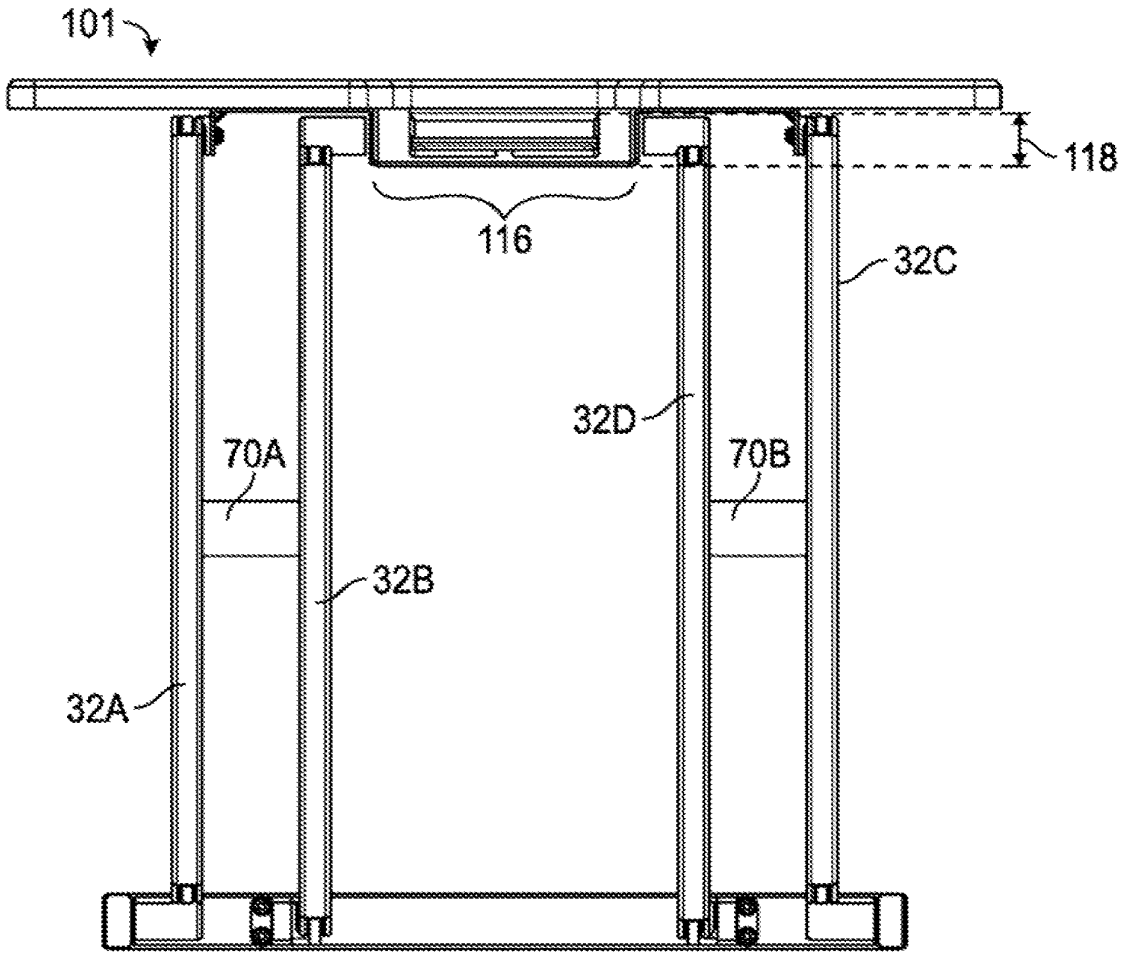


图14

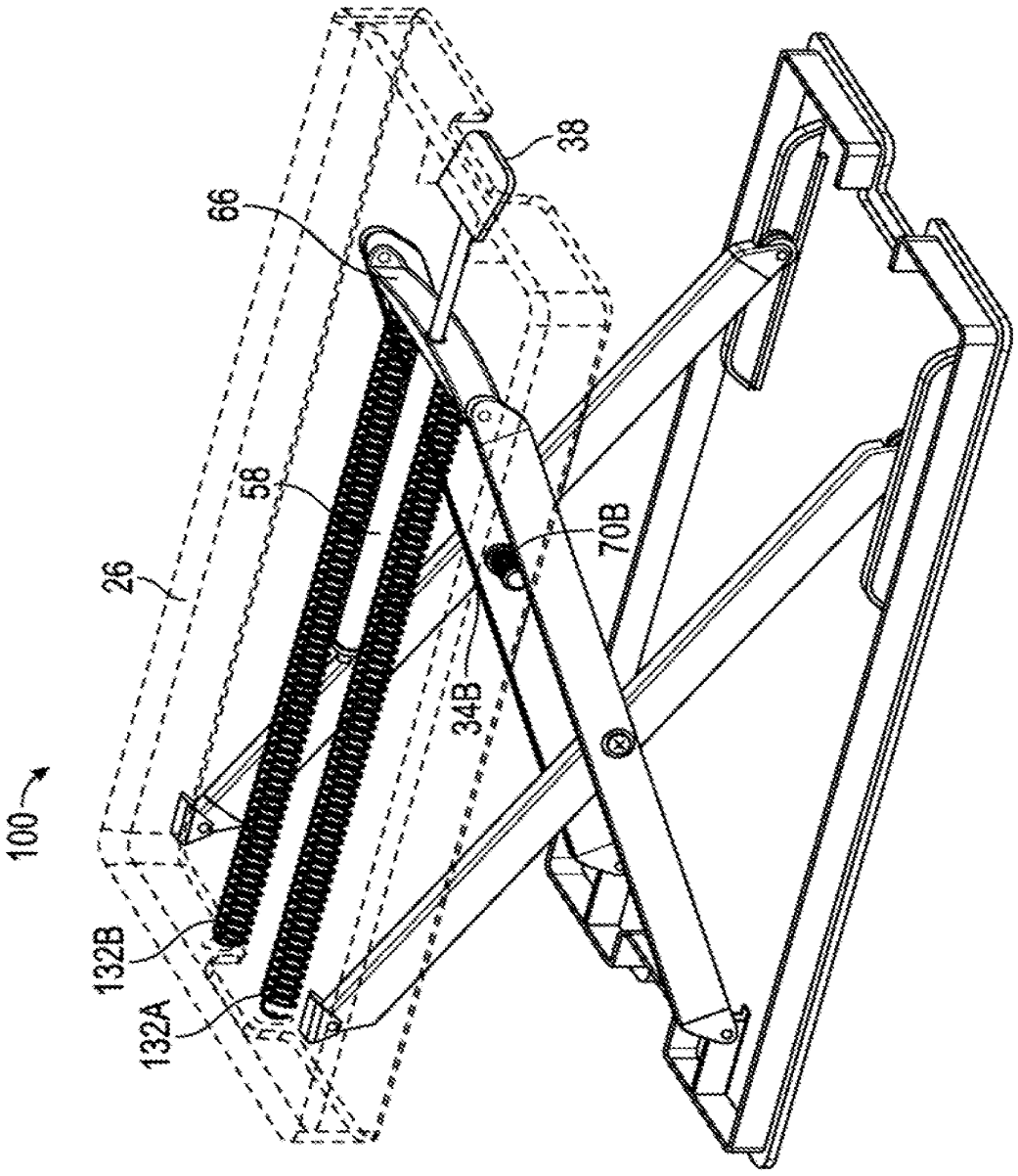


图15

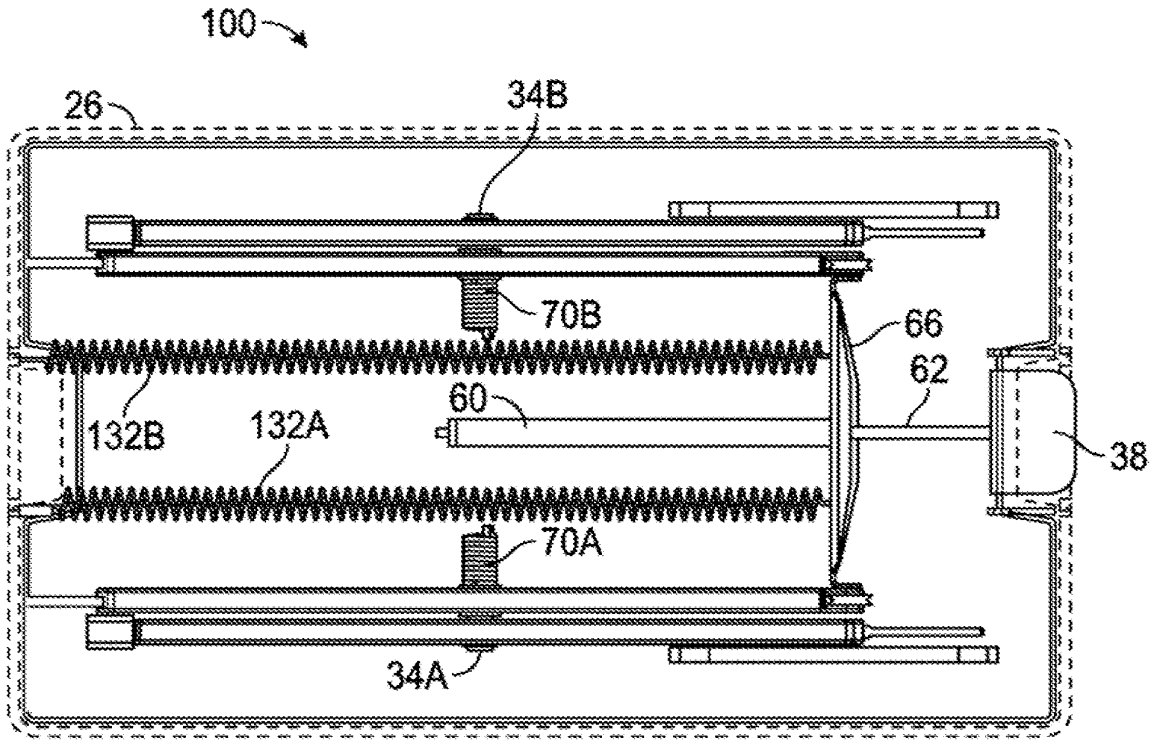


图16

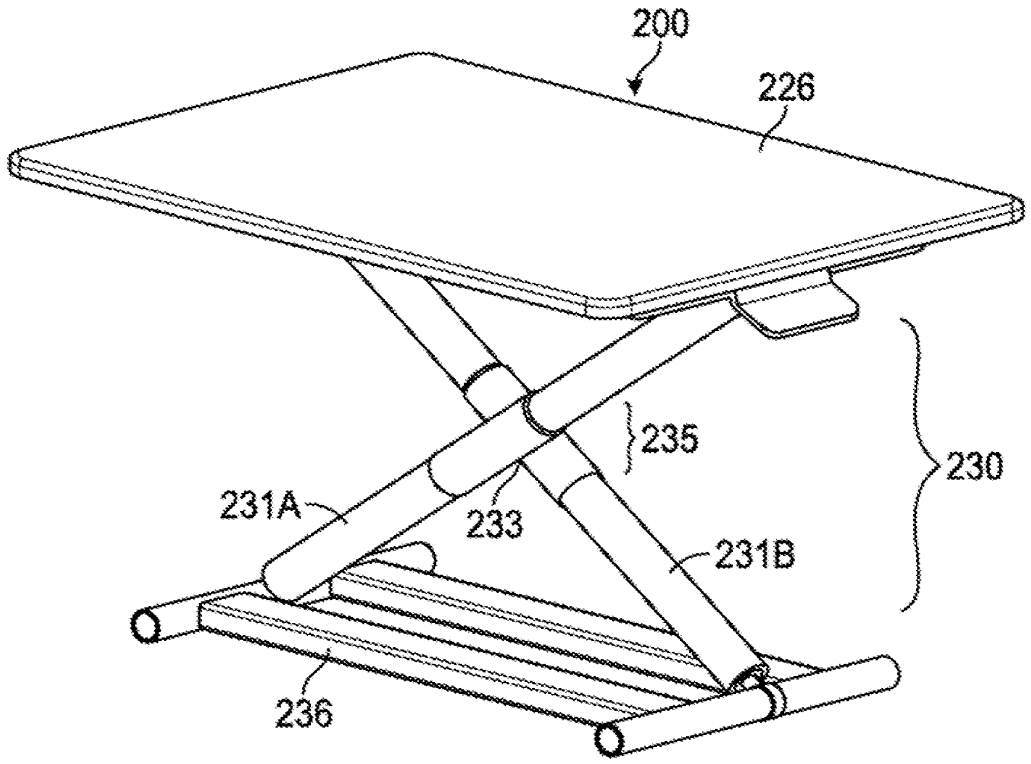


图17

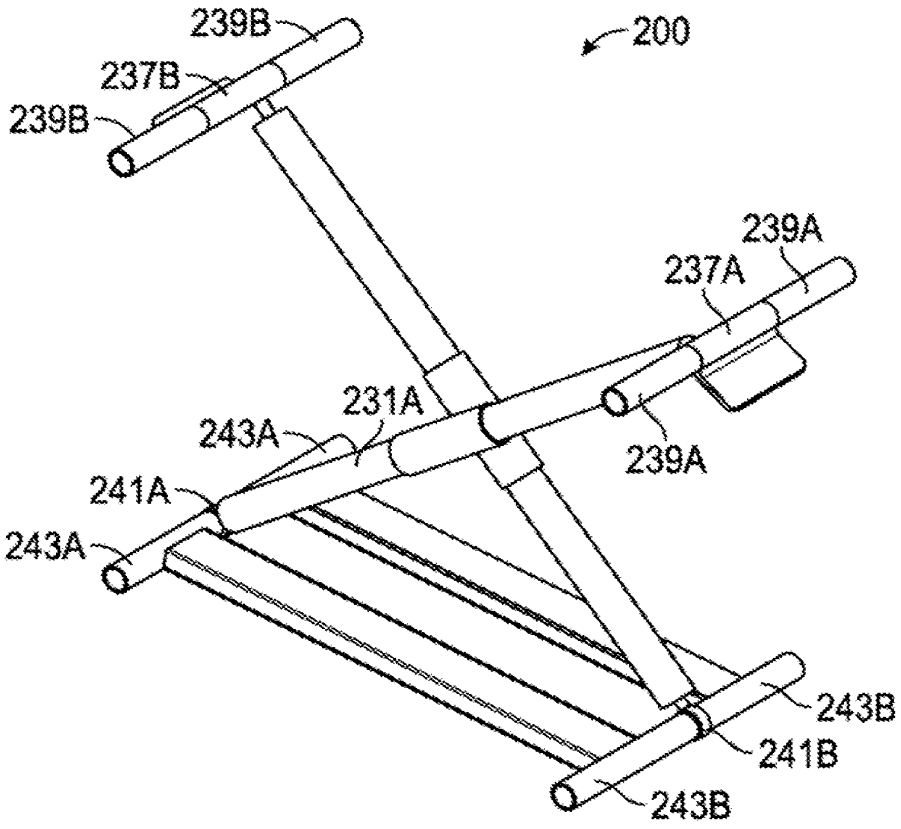

239B
237B
239B
200
239A
237A
231A
243A
239A
241A
243A
243B
241B
243B

图18

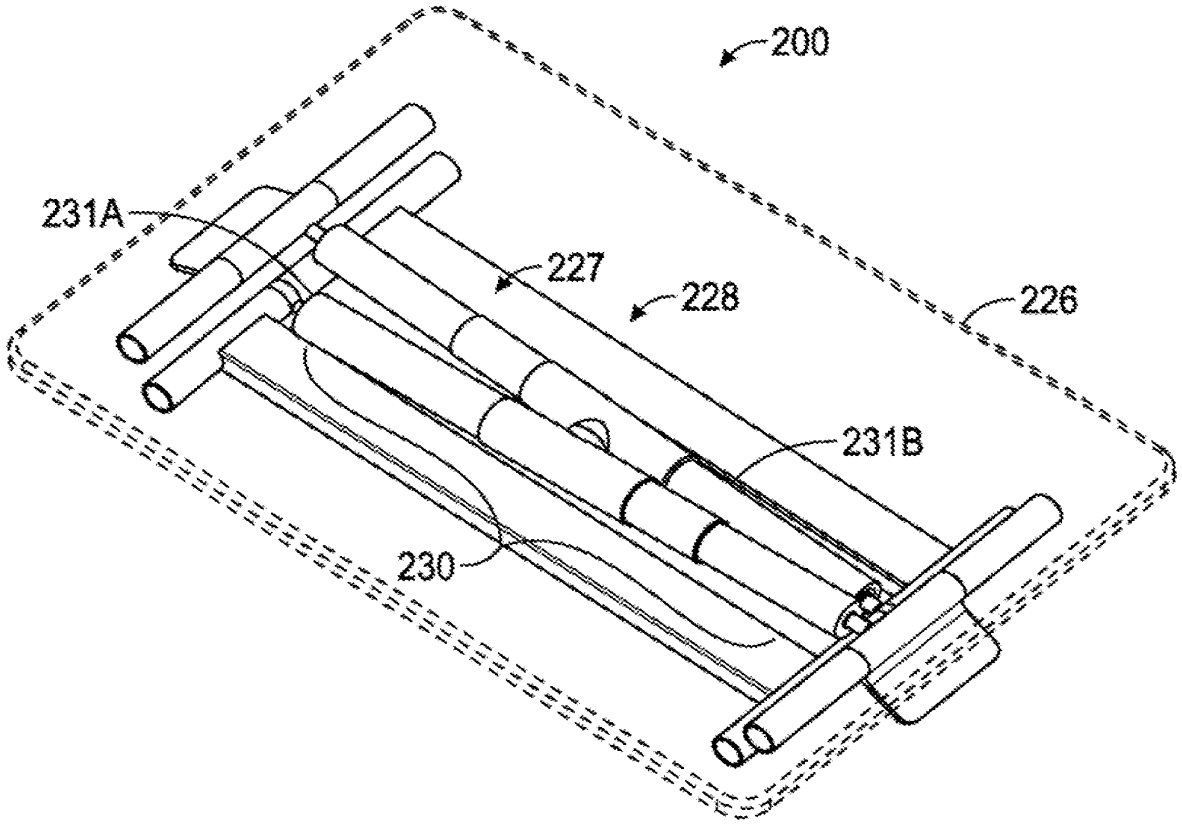


图19

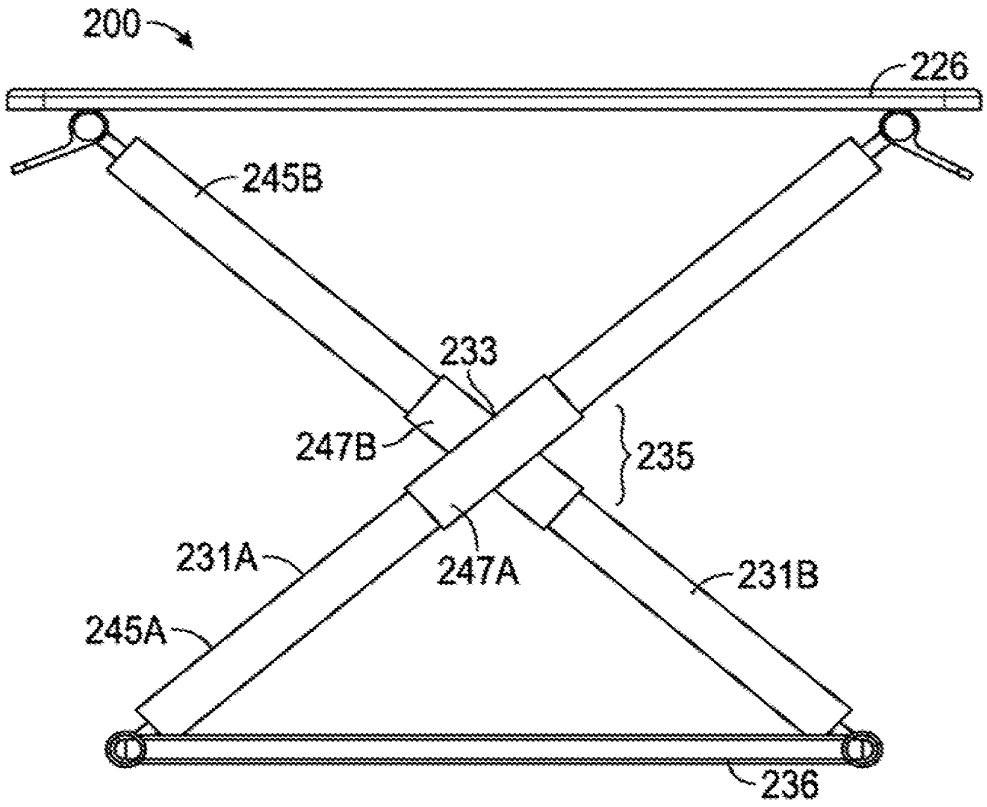


图20

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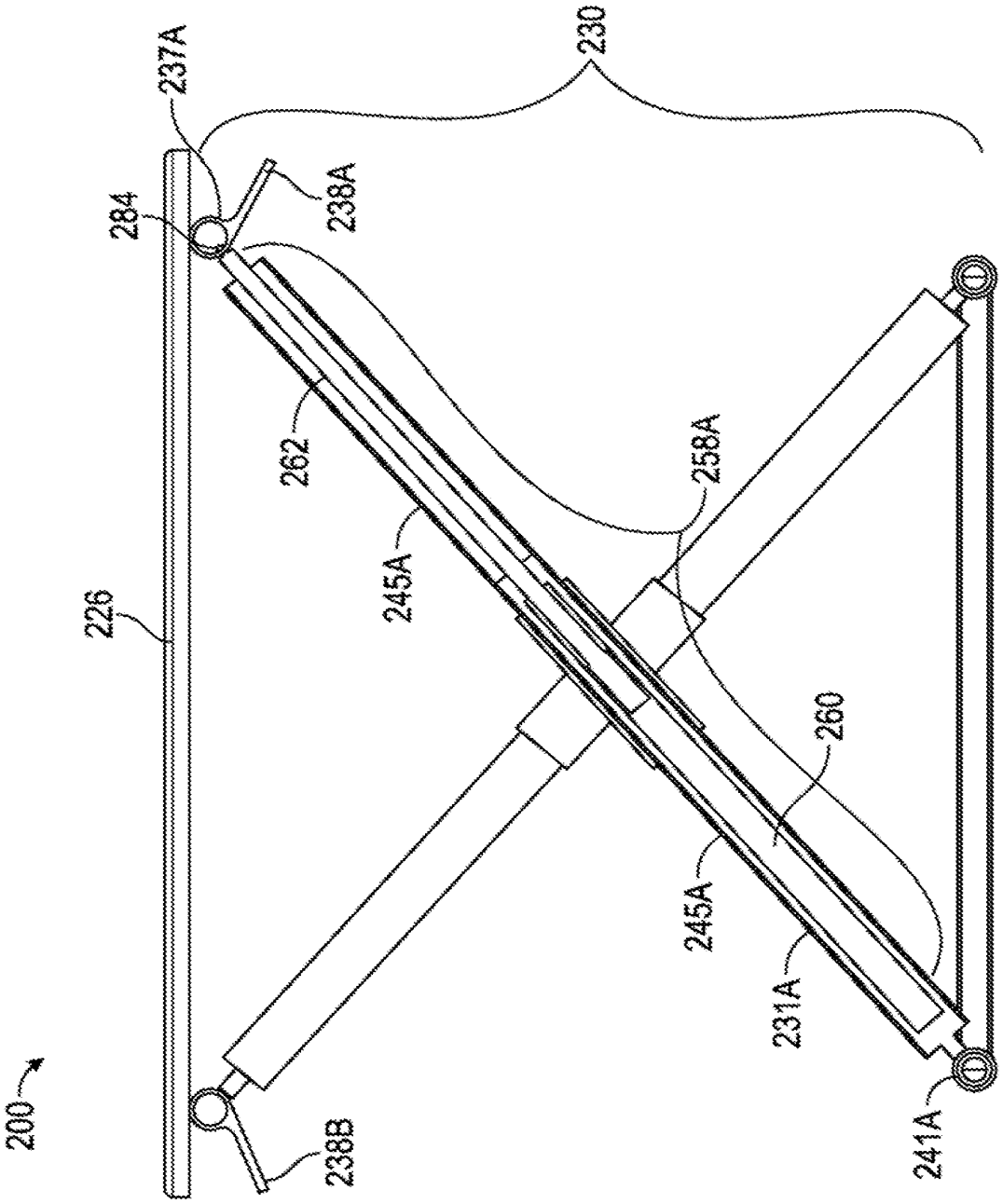


图21

(19) Octrooicentrum Nederland

(11) **2000346**

(12) C **OCTROOI**[20]

(21) Aanvrage om octrooi: **2000346**

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(54) **In hoogte verstelbaar staplateau.**

(57) De uitvinding heeft betrekking op een staplateau omvattende een onderframe dat op een vloer kan rusten, een bovenframe, voorzien van een afneembaar of vast staoppervlak, een stel scharen die scharnierbaar verbonden zijn met het onderframe en het bovenframe, en een bedienbaar verstelmiddel dat verbonden is met ten minste één van de benen van de scharen.

NL C 2000346

De inhoud van dit octrooi komt overeen met de oorspronkelijk ingediende beschrijving met conclusie(s) en eventuele tekening(en).
Octrooicentrum Nederland is een agentschap van het ministerie van Economische Zaken.

P6012737NL

In hoogte verstelbaar staplateau

Achtergrond van de uitvinding

De uitvinding heeft betrekking op een in hoogte verstelbaar staplateau. Een staplateau is algemeen bekend. De bekende inrichtingen hebben echter als nadeel dat ze ofwel niet verstelbaar zijn, ofwel niet geschikt zijn voor een medische werkomgeving zoals een operatiekamer, ofwel te groot zijn.

Samenvatting van de uitvinding

De uitvinding heeft tot doel een staplateau te bieden dat in hoogte verstelbaar is, stabiel is, geschikt is voor veeleisende werkomgevingen zoals ziekenhuizen, in het bijzonder operatiekamers.

Veelal blijkt dat werktafels, zoals operatietafels, onvoldoende in te stellen zijn op de ergonomisch beste werkhoogte. Daarnaast is, zeker wanneer een team van mensen aan dezelfde werktafel moet werken, de optimale werkhoogte niet voor iedereen tegelijkertijd in te stellen.

De uitvinding verschaft daartoe een staplateau volgens conclusie 1.

Dit staplateau is op eenvoudige wijze te verstellen en in te stellen op een gewenste hoogte. Daarnaast in de verstelling nagenoeg traploos. Bovendien bied het plateau een stabiel oppervlak waarop een persoon kan staan, ook voor het uitvoeren van precisie werkzaamheden. Zo kunnen bijvoorbeeld in een operatiekamer diverse personen van verschillende lengte door elk een eigen stahoogte in te stellen op een persoonlijk staplateau aan één enkele operatietafel werken.

Verder aspecten van het staplateau zijn beschreven in de onderconclusies en in onderstaande figuurbeschrijving.

Het moge duidelijk zijn dat de verschillende aspecten genoemd in deze octrooiaanvrage gecombineerd kunnen worden en elk afzonderlijk in aanmerking kunnen komen voor een afgesplitste octrooiaanvrage.

Korte beschrijving van de figuren

In de bijgevoegde figuren zijn diverse uitvoeringsvormen van een staplateau volgens de uitvinding weergegeven waarin getoond wordt in:

Fig. 1 een perspectiefaanzicht schuin van boven;

fig. 2 een perspectiefaanzicht van opzij.

Beschrijving van uitvoeringsvormen

Figuren 1 en 2 tonen een staplateau voorzien van een bovenframe 1 en een onderframe 2. Het onderframe en bovenframe zijn rechthoekige frames van profieldelen, hier L-profielen. Hier zijn beide frames even groot. Op het bovenframe 1 kan een afneembaar staoppervlak 6 geplaatst worden.

Het onderframe 2 en bovenframe 1 zijn onderling verbonden via een stel scharen 3 en 3'. De beide scharen 3, 3' zijn parallel aan elkaar naast elkaar opgesteld en middels verbindingsstangen onderling verbonden. Eén tussenstang verbindt het ene paar benen en een tweede tussenstang verbindt het andere paar benen. In ingeklapte toestand van het staplateau is de lengte van de benen kleiner tot maximaal even groot als de lengte van het de frames 1, 2. De breedte van de tussenstang met de scharen is ongeveer even groot als de breedte van de frames 1, 2. De scharen bestaan beiden uit twee kokerprofieldelen die elk middels een as 9, 9' verbonden zijn.

Eén been van beide scharen is scharnierbaar verbonden middels scharnier 10 met het onderframe 2, en een ander been van beide scharen is scharnierbaar verbonden middels scharnier 11 met het bovenframe 1.

De beide andere benen zijn schuifbaar in een eerste stel geleidingsruimten 8 in het onderframe 2 en in een tweede stel geleidingsruimten 12 in bovenframe 1. Hier zijn in de geleidingsruimten 12 schuifblokken opgenomen die scharnierbaar verbonden zijn met de benen van de scharen 3, 3'.

Het onderframe 2 is hier voorzien van wielen 7 om het staplateau eenvoudig verplaatsbaar te maken. Eventueel kan het onderframe of bovenframe of beiden voorzien zijn van handgrepen.

Het staplateau is verder voorzien van een verstelmiddel 4, hier een middels een voetbediening 5 bedienbare hydraulische cilinder 4.

In ingeklapte toestand rusten hier het onderframe 2 en het bovenframe 1 op elkaar en vallen bede scharen in de profieldelen van de frames. Hierdoor is het staplateau in ingeklapt toestand plat en compact en stabiel, en kan er op gestaan worden zodat de minimale stahoogte bereikt kan worden van rond de 5 cm. Hiertoe valt ook het verstelmiddel 4 binnen de frames in ingeklapte toestand.

Het verstelmiddel 4 grijpt aan op een verbindingsstand die beide scharen 3, 3' onderling verbindt.

Het moge duidelijk zijn dat de bovenstaande beschrijving is opgenomen om de werking van voorkeursuitvoeringen van de uitvinding te illustreren, en niet om de reikwijdte van de uitvinding te beperken. Uitgaande van de bovenstaande uiteenzetting zullen voor een vakman vele variaties evident zijn die vallen onder de geest en de reikwijdte van de onderhavige uitvinding

CONCLUSIES

1. Staplateau omvattende een onderframe dat op een vloer kan rusten, een bovenframe, voorzien van een afneembaar of vast staoppervlak, een stel scharen die scharnierbaar verbonden zijn met het onderframe en het bovenframe, en een bedienbaar verstelmiddel dat verbonden is met ten minste één van de benen van de scharen.

2. Staplateau volgens conclusie 1, waarbij het onderframe en het bovenframe elk een rechthoekig raam van L-profieldelen omvat, waarbij bij voorkeur in ingeklapte toestand van het staplateau het onder- en bovenframe op elkaar rusten en de scharen binnen de profieldelen rusten.

3. Staplateau volgens conclusie 1 of 2, waarbij het verstelmiddel een bedienbaare hydraulische of pneumatische cilinder omvat, die in ingeklapte toestand van het staplateau binnen het bovenframe en het onderframe valt.

4. Staplateau volgens één der voorgaande conclusies, waarbij het staplateau verstelbaar is van een hoogte van ongeveer 5-40 cm.

5. Inrichting voorzien van een of meer van de in de bijgevoegde beschrijving omschreven en/of in de bijgevoegde tekeningen getoonde kenmerkende maatregelen.

-o-o-o-o-o-o-

Fig 1

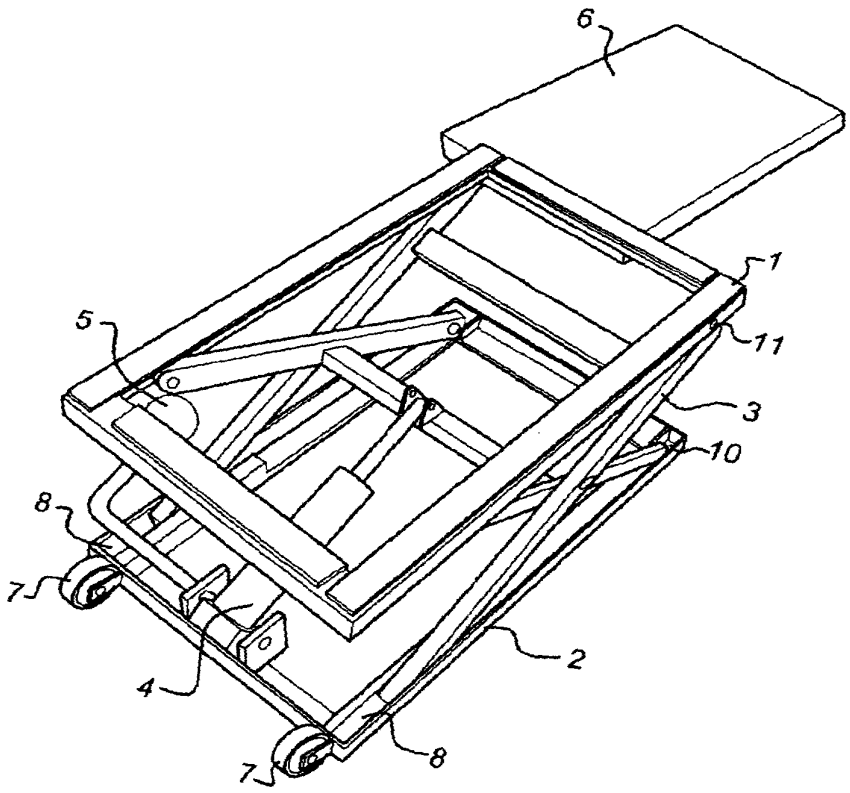
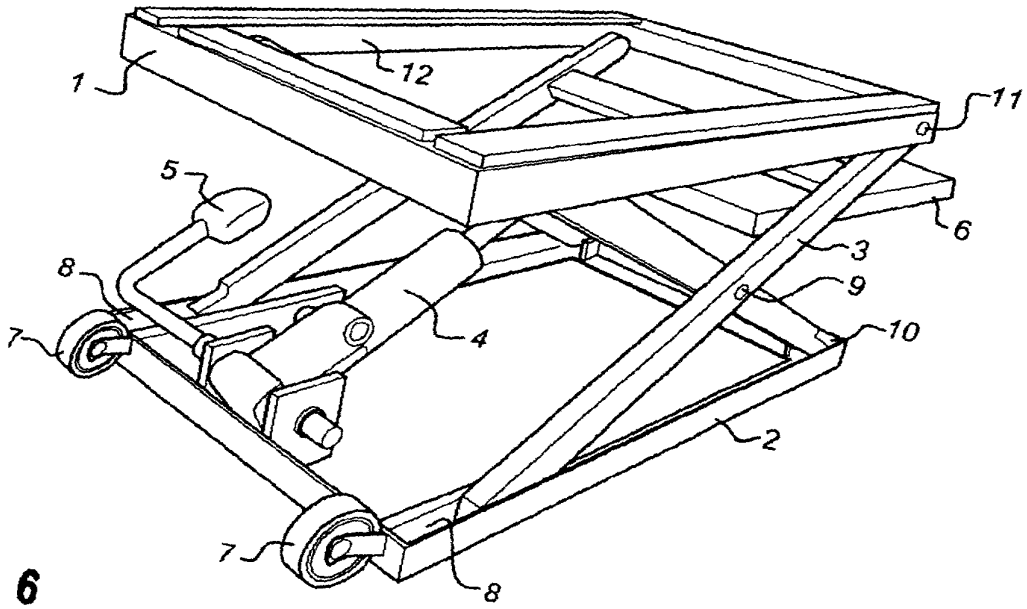


Fig 2



2000346

SAMENWERKINGSVERDRAG (PCT)

RAPPORT BETREFFENDE NIEUWHEIDSONDERZOEK VAN INTERNATIONAAL TYPE

IDENTIFICATIE VAN DE NATIONALE AANVRAGE	KENMERK VAN DE AANVRAGER OF VAN DE GEMACHTIGDE
	P6012737NL
Nederlands aanvraag nr. 2000346	Indieningsdatum 28-11-2006
	Ingeroepen voorrangsdatum
Aanvrager (Naam) BIN Innovations	
Datum van het verzoek voor een onderzoek van internationaal type	Door de Instantie voor Internationaal Onderzoek aan het verzoek voor een onderzoek van internationaal type toegekend nr. SN 48222

I. CLASSIFICATIE VAN HET ONDERWERP (bij toepassing van verschillende classificaties, alle classificatiesymbolen opgeven)

Volgens de internationale classificatie (IPC)

B06F7/08

II. ONDERZOCHTE GEBIEDEN VAN DE TECHNIEK

Onderzochte minimumdocumentatie

Classificatiesysteem	Classificatiesymbolen
IPC8	B06F A47C

Onderzochte andere documentatie dan de minimum documentatie, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen

III.	X	GEEN ONDERZOEK MOGELIJK VOOR BEPAALDE CONCLUSIES	(opmerkingen op aanvullingsblad)
IV.		GEBREK AAN EENHEID VAN UITVINDING	(opmerkingen op aanvullingsblad)

Form PCT/ISA 201 A (11/2000)

ONDERZOEKSRAPPORT BETREFFENDE HET RESULTAAT VAN HET ONDERZOEK NAAR DE STAND VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE

Nummer van het verzoek om een onderzoek naar de stand van de techniek
NL 2000346

A. CLASSIFICATIE VAN HET ONDERWERP
INV. B66F7/08

Volgens de Internationale Classificatie van octrooien (IPC) of zowel volgens de nationale classificatie als volgens de IPC.

B. ONDERZOCHTE GEBIEDEN VAN DE TECHNIEK

Onderzochte miminum documentatie (classificatie gevolgd door classificatiesymbolen)
B66F A47C

Onderzochte andere documentatie dan de mimimum documentatie, voor dergelijke documenten, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen

Tijdens het onderzoek geraadpleegde elektronische gegevensbestanden (naam van de gegevensbestanden en, waar uitvoerbaar, gebruikte trefwoorden)
EPO-Internal

C. VAN BELANG GEACHTE DOCUMENTEN

Categorie °	Geciteerde documenten, eventueel met aanduiding van speciaal van belang zijnde passages	Van belang voor conclusie nr.
	ONVOLLEDIG ONDERZOEK zie aanvullingsblad C	
X	US 4 577 821 A (EDMO TORBJOERN [SE] ET AL) 25 maart 1986 (1986-03-25) figuren 1,2	1-3
X	GB 981 991 A (COTTERELL & PITHER LTD) 3 februari 1965 (1965-02-03) kolom 2, regel 59 - kolom 3, regel 98; figuren 1,2	1-3
X	EP 1 026 118 A (ADAMS WILLIAM MARK [GB]) 9 augustus 2000 (2000-08-09) samenvatting; figuren 1A-1D alineas [0001], [0010], [0017]	1,3,4

-/--

[X] Verdere documenten worden vermeld in het vervolg van vak C.

[X] Leden van dezelfde octrooifamilie zijn vermeld in een bijlage

° Speciale categorieën van aangehaalde documenten

"A" niet tot de categorie X of Y behorende literatuur die de stand van de techniek beschrijft

"D" in de octrooiaanvrage vermeld

"E" eerdere octrooi(aanvrage), gepubliceerd op of na de indieningsdatum, waarin dezelfde uitvinding wordt beschreven

"L" om andere redenen vermelde literatuur

"O" niet-schriftelijke stand van de techniek

"P" tussen de voorrangsdatum en de indieningsdatum gepubliceerde literatuur

"T" na de indieningsdatum of de voorrangsdatum gepubliceerde literatuur die niet bezwarend is voor de octrooiaanvrage, maar wordt vermeld ter verheldering van de theorie of het principe dat ten grondslag ligt aan de uitvinding

"X" de conclusie wordt als niet nieuw of niet inventief beschouwd ten opzichte van deze literatuur

"Y" de conclusie wordt als niet inventief beschouwd ten opzichte van de combinatie van deze literatuur met andere geciteerde literatuur van dezelfde categorie, waarbij de combinatie voor de vakman voor de hand liggend wordt geacht

"&" lid van dezelfde octrooifamilie of overeenkomstige octrooipublicatie

Datum waarop het onderzoek naar de stand van de techniek van internationaal type werd voltooid	Verzenddatum van het rapport van het onderzoek naar de stand van de techniek van internationaal type
12 Juli 2007	

Naam en adres van de instantie	De bevoegde ambtenaar
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Verheul, Omiros

6

Formulier PCT/ISA/201 (tweede blad) (Januari 2004)

bladzijde 1 van 2

ONDERZOEKSRAPPORT BETREFFENDE HET
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE

Nummer van het verzoek om een onderzoek naar de stand van de techniek
NL 2000346

C.(Vervolg). VAN BELANG GEACHTE DOCUMENTEN

Categorie °	Geciteerde documenten, eventueel met aanduiding van speciaal van belang zijnde passages	Van belang voor conclusie nr.
X	JP 07 101687 A (DAISHIN SHOKO KK) 18 april 1995 (1995-04-18) samenvatting; figuren	1,3,4
X	US 5 322 143 A (CURRAN ROBERT J [CA]) 21 juni 1994 (1994-06-21) samenvatting; figuren 1-4,8 kolom 2, regel 16 - kolom 4, regel 55	1,3

6

ONVOLLEDIG ONDERZOEK
AANVULLINGSBLAD C

Octroolaanvrage Nr.:
SN 48222
NL 2000346

Dit verslag van het onderzoek heeft geen betrekking op bepaalde conclusies omdat deze betrekking hebben op delen van de nationale aanvrage die niet voldoen aan de voorgeschreven vereisten, en wel in die mate dat geen zinvol nieuwheidsonderzoek verricht kan worden, in het bijzonder:

Volledig onderzochte conclusie(s):
1-4

Niet onderzochte conclusie(s):
5

Reden voor de beperking van het onderzoek:

Dit verslag van het onderzoek heeft geen betrekking op bepaalde conclusies omdat deze betrekking hebben op delen van de nationale aanvrage die niet voldoen aan de voorgeschreven vereisten, en wel in die mate dat geen zinvol nieuwheidsonderzoek verricht kan worden, in het bijzonder:
Omdat conclusies behalve waar absoluut noodzakkelijk, niet afhankelijk, in respect van technische eigenschappen van de uitvinding, van referenties naar de beschrijving of tekeningen mogen zijn, in het bijzonder, zullen zij niet afhankelijk zijn van zulke referenties, als: "zoals omschreven in deel...van de beschrijving," of "als geïllustreerd in figuur...van de tekeningen", wordt conclusie 5 niet onderzoekt.

ONDERZOEKSRAPPORT BETREFFENDE HET
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE
Informatie over leden van dezelfde octrooifamilie

Nummer van het verzoek om een onderzoek naar de stand van de techniek
NL 2000346

In het rapport genoemd octrooigeschrift	Datum van publicatie	Overeenkomend(e) geschrift(en)	Datum van publicatie
US 4577821 A	25-03-1986	EP 0136986 A1	10-04-1985
		SE 450486 B	29-06-1987
		SE 8304655 A	01-03-1985
GB 981991 A	03-02-1965	GEEN	
EP 1026118 A	09-08-2000	US 6394419 B1	28-05-2002
JP 7101687 A	18-04-1995	JP 8015999 B	21-02-1996
US 5322143 A	21-06-1994	GEEN	

Formulier PCT/ISA/201 (vervolgblad octrooifamilie) (Januari 2004)

OCTROOICENTRUM NEDERLAND

WRITTEN OPINION

File No.	Filing date *(day/month/year)*	Priority date *(day/month/year)*	Application No.
SN48222	28.11.2006		NL2000346

International Patent Classification (IPC)
INV. B66F7/08 *

Applicant
BIN Innovations te Delfgauw

This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the application
- ☐ Box No. VIII Certain observations on the application

	Examiner
	Verheul, Omiros

Form (NL237A) (Dekblad) (July 2006)

WRITTEN OPINION

Box No. I Basis of this opinion

1. This opinion has been established on the basis of the latest set of claims filed before the start of the search.

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the application and necessary to the claimed invention, this opinion has been established on the basis of:

   a. type of material:

   ☐ a sequence listing

   ☐ table(s) related to the sequence listing

   b. format of material:

   ☐ on paper

   ☐ in electronic form

   c. time of filing/furnishing:

   ☐ contained in the application as filed.

   ☐ filed together with the application in electronic form.

   ☐ furnished subsequently for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

WRITTEN OPINION

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step, or to be industrially applicable have not been examined in respect of

☐ the entire application

☒ claims Nos. 5

because:

☐ the said application, or the said claims Nos. relate to the following subject matter which does not require a search *(specify)*:

☐ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. are so unclear that no meaningful opinion could be formed *(specify)*:

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed *(specify)*:

☒ no search report has been established for the whole application or for said claims Nos. 5

☐ a meaningful opinion could not be formed as the sequence listing was either not available, or was not furnished in the international format (WIPO ST25).

☐ a meaningful opinion could not be formed without the tables related to the sequence listings; or such tables were not available in electronic form.

☐ See Supplemental Box for further details.

Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty	Yes:	Claims	
	No:	Claims	1-4
Inventive step	Yes:	Claims	
	No:	Claims	1-4
Industrial applicability	Yes:	Claims	1-4
	No:	Claims	

2. Citations and explanations

see separate sheet

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

Claims shall not, except where absolutely necessary, rely, in respect of the technical features of the invention, on references to the description or drawings. In particular, they shall not rely on such references as: "as described in part...of the description," or "as illustrated in figure...of the drawings".

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:
D1: US-A-4 577 821 (EDMO TORBJOERN [SE] ET AL) 25 maart 1986 (1986-03-25)
D2: GB 981 991 A (COTTERELL & PITHER LTD) 3 februari 1965 (1965-02-03)
D3: EP-A-1 026 118 (ADAMS WILLIAM MARK [GB]) 9 augustus 2000 (2000-08-09)

1 Novelty

1.1) The present application does not meet the criteria of patentability, because the subject-matter of claims 1-4 is not new.

1.2) The document D1 discloses (the references in parentheses applying to this document): Staplateau omvattende een onderframe (3) dat op een vloer kan rusten, een bovenframe (4), voorzien van een afneembaar of vast staoppervalk (4), een stel scharen (1,2) die scharnierbaar verbonden zijn met het onderframe (3) en het bovenframe (4), en een bedienbaar verstelmiddel (12) dat verbonden is met ten minste een van de benen van de scharen (1,2).

1.3) D1 also contains the additional features of:
- dependent claim 2, see fig.2,L-profile shape at edge of table 4 and also of base 3
- dependent claim 3, hydraulic cylinder 12

1.4) D2 contains also the features of independent claim 1 and the additional features of

dependent claim 3.

1.5) D3 contains also the features of independent claim 1 and the additional features of dependent claims 3 and 4 (see paragraph 1, lines 11 and 12, where the height of loading a person onto a rail carriage or a bus is within the range specified by the claim).

2 Inventive step

2.1) The present application does not meet the criteria of patentability, because the subject-matter of claim 2 does not involve an inventive step.

2.2) In claim 2 a slight constructional change in the profile of the upper and lower raam van profieldelen is defined which comes within the scope of the customary practice followed by persons skilled in the art, especially as the advantages thus achieved can readily be foreseen (see D2, figure 1 base frame 2 (between bars 9 is an L-type profieldeel). Consequently, the subject-matter of claim 2 lacks an inventive step.

(19) BUNDESREPUBLIK DEUTSCHLAND

DEUTSCHES PATENTAMT

(12) Übersetzung der europäischen Patentschrift

(87) EP 0 531 385 B1

(10) DE 691 11 809 T 2

(51) Int. Cl.[6]: B 60 P 3/36
A 47 B 9/16

DE 691 11 809 T 2

(21) Deutsches Aktenzeichen: 691 11 809.4
(86) PCT-Aktenzeichen: PCT/SE91/00364
(86) Europäisches Aktenzeichen: 91 910 139.4
(87) PCT-Veröffentlichungs-Nr.: WO 91/17906
(86) PCT-Anmeldetag: 22. 5. 91
(87) Veröffentlichungstag der PCT-Anmeldung: 28. 11. 91
(87) Erstveröffentlichung durch das EPA: 17. 3. 93
(87) Veröffentlichungstag der Patenterteilung beim EPA: 2. 8. 95
(47) Veröffentlichungstag im Patentblatt: 18. 4. 96

(30) Unionspriorität: (32) (33) (31)
22.05.90 SE 9001844

(73) Patentinhaber:
Lindahl, Gunnar, Dorotea, SE

(74) Vertreter:
Patentanwälte Hansmann-Klickow-Hansmann, 22767 Hamburg

(72) Erfinder:
gleich Anmelder

(84) Benannte Vertragstaaten:
DE, FR, GB

(54) STÜTZE.

Anmerkung: Innerhalb von neun Monaten nach der Bekanntmachung des Hinweises auf die Erteilung des europäischen Patents kann jedermann beim Europäischen Patentamt gegen das erteilte europäische Patent Einspruch einlegen. Der Einspruch ist schriftlich einzureichen und zu begründen. Er gilt erst als eingelegt, wenn die Einspruchsgebühr entrichtet worden ist (Art. 99 (1) Europäisches Patentübereinkommen).

Die Übersetzung ist gemäß Artikel II § 3 Abs. 1 IntPatÜG 1991 vom Patentinhaber eingereicht worden. Sie wurde vom Deutschen Patentamt inhaltlich nicht geprüft.

DE 691 11 809 T 2

BUNDESDRUCKEREI 02. 96 602 316/421

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0 531 385
(P.5710 EU/DE)

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Avaträsk 436, S-910 70 DOROTEA

Gestell

Die Erfindung betrifft ein Tischgestell vorzugsweise zur Verwendung in Wohnwagen und Wohnmobilen, welches oben ein rahmenähnliches Teil trägt, auf das eine Tischplatte zu plazieren ist und das vertikal so eingestellbar ist, daß die Tischplatte in verschiedenen Höhen positionierbar ist, und zwar gemäß dem Oberbegriff von Anspruch 1 und z.B. der US-A 558.648.

Die für Wohnwagen und Wohnmobile vorgesehenen Tische haben normalerweise die Form einer Tischplatte, die an der Oberseite eines Gestells befestigt ist. Diese Art von Tischen ist normalerweise für zwei verschiedene Zwecke vorgesehen. Einerseits dienen sie zur Verwendung als herkömmlicher Mittagstisch, von dem in einem Wohnwagen oder Wohnmobil Nahrung und Kaffee eingenommen werden können. Andererseits soll ein solcher Tisch

...

angehoben und abgesenkt werden können, so daß es möglich ist, den Tisch in eine Position abzusenken, in der er in dem Wohnwagen/Wohnmobil als Teil eines Bettes dient. Das Anheben und Absenken eines Tisches ist bisher ein komplizierter und somit zeitaufwendiger Vorgang gewesen.

Der Erfindung liegt die Aufgabe zugrunde, diese Probleme zu beseitigen und ein Tischplattengestell zu schaffen, welches beim Absenken und Anheben leicht gehandhabt und bewegt werden kann. Diese Aufgabe wird mit einem Gestell der oben genannten Art gelöst, welches die Merkmale des kennzeichnenden Teils des Anspruchs 1 aufweist.

Eine bevorzugte Ausführungsform der Erfindung soll nun im Detail mit Bezug auf die Zeichnungen beschrieben werden. Es zeigt:

Fig. 1 ein erfindungsgemäßes Gestell in einer angehobenen Position, welches mit einer verriegelbaren Gasdruckfeder und einer Feder-Betätigungs- oder Aktivierungseinrichtung versehen ist;

Fig. 2 das Gestell gemäß Figur 1 in einer abgesenkten Position;

Fig. 3 und 4 die Befestigung der Gasdruckfeder an dem oberen Teil des Gestells, wobei Figur 4 die Befestigung von unten und Figur 5 die Konstruktion der Betätigungseinrichtung zeigt.

Die Figuren 1 und 2 zeigen das erfindungsgemäße Gestell. Das Gestell umfaßt ein rahmenähnliches Teil 1,

...

das durch zwei Beinglieder 2, 3 getragen wird. Jedes Beinglied 2, 3 umfaßt zwei im wesentlichen parallele Stäbe oder Stangen 4, 5; 6, 7, wobei die zwei Stangen jedes Stangenpaares voneinander beabstandet und an beiden Enden mittels eines entsprechenden Querstabes 8, 9; 10, 11 miteinander verbunden sind, wobei die ganz unten liegenden Querstäbe 8; 10 zum Abstützen des Gestells an einer darunterliegenden Stützfläche dienen und die oberen Querstäbe 9; 11 zum Zusammenwirken mit dem rahmenähnlichen Teil vorgesehen sind. Die zwei Beinglieder 2, 3, d.h. die Stangenpaare 4, 5; 6, 7 sind über eine Gelenkeinrichtung oder einen Drehzapfen in Form eines Querstabes 12 miteinander verbunden, der sich durch die Stangen näherungsweise auf ihrer halber Länge erstreckt, vorzugsweise an einer Stelle, die geringfügig über der Mitte liegt. Dadurch können sich die zwei Enden der entsprechenden Stangenpaare 4, 5; 6, 7 scherenartig aufeinander zu und voneinander wegbewegen und somit das rahmenähnliche Teil 1 vertikal bewegen.

Das rahmenartige Teil 1 und die Stangen der dargestellten Ausführungsform sind aus lackiertem Stahlblech gefertigt, wobei das rahmenartige Teil vier Stangen 13-16 umfaßt, die in Form eines Rechtecks angeordnet sind. Das Gestell kann natürlich auch aus anderen Materialien hergestellt sein, und das rahmenähnliche Teil 1 kann die Form eines Quadrates haben. Mindestens zwei der Rahmenstangen, bei der dargestellten Ausführungsform die sich längserstreckenden Stangen 14, 15, haben einen im wesentlichen U-förmigen Querschnitt, wobei die Schenkel des "U" nach innen gerichtet sind. Die oberen Querstäbe 9, 11 der zwei Beinglieder 2, 3 sind zum Zusammenwirken mit den Stangen 14, 15 des Rahmens vorgesehen. Der eine Querstab 9 ist schwenkbar in den Stangen 14, 15 befestigt, während der andere

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Querstab 11 an beiden Enden mit geeigneten Einrichtungen zum Gleiten in dem U-förmigen Teil der Stangen versehen ist, um die oben genannte scherenartige Bewegung der Beinglieder zu ermöglichen.

Ein wesentliches Kennzeichen der Erfindung liegt darin, daß eine sperrbare Gasdruckfeder 17 oder eine Kolben-Zylinderanordnung vorgesehen ist, die eine vertikale Einstellung der Position des rahmen- ähnlichen Teils 1 in weicher und kontinuierlicher Weise ermöglicht, und zwar sowohl in einer Richtung nach oben als auch in einer Richtung nach unten. Die Gasdruckfeder umfaßt einen unteren Teil 18, der schwenkbar mit dem Beinglied 3 unterhalb des Schwenkstabes 12 verbunden ist und einen oberen Teil 19, der schwenkbar mit der Quer-Rahmenstange 15 an der gleichen Seite einer vertikalen, durch den Stab 12 verlaufenden Ebene verbunden ist, wie der untere Teil 18 (siehe auch Figuren 3 und 4).

Die Gasdruckfeder 17 ist mit einem zentral positionierten Stift 20 versehen, der geringfügig aus dem oberen Teil 19 der Gasdruckfeder in einer axialen Richtung hervorsteht. Dieser Stift 20 ist zur Aktivierung eines innerhalb der Gasdruckfeder vorhandenen Auslöse-(Freigabe-) ventils vorgesehen.

Der Stift 20 ist zum Zusammenwirken mit einer zylindrischen Durchführung 21 vorgesehen, die mittels Schrauben oder ähnlichem schwenkbar mit einer Halteeinrichtung 23 verbunden ist, die an der Innenseite der Rahmenstange 15 befestigt ist. Der Stift 20 erstreckt sich somit gerade durch die Durchführung 21 in ihrer Querrichtung und ragt geringfügig aus der Durchführung heraus, um mit einer Betätigungs- oder Aktivierungseinrichtung 24 (siehe auch Figur 5) zusammenzuwirken. Da die Durchführung 21 schwenkbar mit der Halteeinrichtung

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23 verbunden ist und da das untere Teil 18 der Gasdruckfeder 17 schwenkbar mit dem Beinglied 3 verbunden ist, kann die Gasdruckfeder verschiedene Winkelpositionen in Relation zu dem rahmenähnlichen Teil 1 des Gestells und dem Beinglied 3 einnehmen. Bei dieser Ausführungsform weist das Beinglied 3 zwei parallele Stäbe oder Stangen 6, 7 auf. Das untere Teil 18 der Gasdruckfeder 17 ist somit schwenkbar mit einem Querstab 25 verbunden, der wiederum die Stangen oder Stäbe 6, 7 miteinander verbindet und der unter dem Gelenk oder Drehstab 12 positioniert ist.

Die Betätigungseinrichtung 24 hat eine längliche Form und einen an ihrer Rückseite angeordneten Griff 26 sowie einen Abschnitt 27, der dazu dient, mit dem Ende des Stiftes 20 an dessen Vorderseite einzu- greifen. Der Abschnitt 27 ist mit einem Loch 28 versehen, durch das die Betätigungseinrichtung schwenkbar mit der Halteeinrichtung 23 im wesentlichen unmittelbar über dem Drehzapfen 22 zur Befestigung der Durchführung 21 verbunden ist. Die Position des Drehzapfens 22 ist in Figur 5 mit "x" angegeben. Der vordere Abschnitt 27 der Betätigungseinrichtung 24 ist ferner mit einer konkaven Ausnehmung 29 versehen, die dazu vorgesehen ist, an dem des Endes des Drehzapfens 20 anzuliegen und im wesentlichen einen Winkel von 90° eines Kreises einschließt. Die Radien R der Ausnehmung 29 sind somit im wesentlichen die gleichen und werden von "x" entnommen. Ein wichtiger, dadurch erreichter Vorteil besteht darin, daß die durch die Betätigungseinrichtung auf den Drehzapfen 20 ausgeübte Kraft im wesentlichen in Längsrichtung des Drehzapfens wirkt, und zwar unabhängig von der Höhenposition des Gestells, d.h. unabhängig von dem Winkel zwischen der Betätigungseinrichtung 24 und der Verlängerung der Längsachse des Drehzapfens 20. Diese Tatsache ermöglicht eine wirkungsvolle Arbeitsweise der

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Gasdruckfeder 17. Wenn der Drehzapfen 20 mit der Betätigungseinrichtung 24 nach innen gedrückt wird, öffnet das Auslöseventil in der Gasdruckfeder. Die Gasdruckfeder wird dadurch mit einer Kraft zusammengedrückt, die größer ist, als der durch die Gasdruckfeder ausgeübte Widerstand, der entsteht, wenn das Gestell in eine niedrigere Position nach unten gedrückt wird. Wenn es gewünscht wird, das Gestell in dieser niedrigen Höhe zu belassen, wird der Druck auf den Drehzapfen weggenommen, wodurch dieser in seine Anfangsposition zurückkehrt. Dadurch wird das Auslöseventil in der Gasdruckfeder geschlossen und die Feder blockiert, so daß sie als fester Stab wirkt. Wenn das Gestell angehoben werden soll, wird der Drehzapfen 20 mit der Betätigungseinrichtung 24 eingedrückt, wodurch das Rahmenteil des Gestells auf die gewünschte Position angehoben wird. Anschließend wird der Druck auf den Drehzapfen wieder entfernt.

Es soll darauf hingewiesen werden, daß die Erfindung nicht auf die beschriebene Ausführungsform beschränkt ist und daß Modifikationen vorgenommen werden können, ohne den Schutzumfang zu verlassen. Jedes Beinglied kann z.B. anstelle der in der beschriebenen Ausführungsform verwendeten zwei miteinander verbundenen Stangen aus einer einzelnen Stange bestehen.

...

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Patentansprüche

1. Tischgestell, vorzugsweise zur Verwendung in Wohnwagen, Wohnmobilen und dergleichen, das folgendes umfaßt: ein oberes rahmenähnliches Teil (1), auf das eine Tischplatte plaziert werden soll, mindestens zwei Beinglieder (2,3), die über ein Gelenk oder einen Drehzapfen (12) gelenkig oder schwenkbar miteinander verbunden sind, so daß sich die auf beiden Seiten des Gelenkes oder Drehzapfens befindenden Teile der Beinglieder scherenartig aufeinander zu oder voneinander weg bewegen können, wodurch die Höhe des oberen rahmenartigen Teils (und der Tischplatte) eingestellt werden kann, ein Gewichtsausgleichsmittel zum Ausgleich u.a. des Gewichts der Tischplatte und ein Verriegelungsmittel zur Verriegelung der Beinglieder in einer der eingestellten Höhe entsprechenden Winkelposition, wobei das Gewichtsausgleichsmittel eine Gasdruckfeder (17) umfaßt, die zwischen einem der

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Beinglieder und dem oberen rahmenartigen teil wirkt, dadurch gekennzeichnet, daß das Verriegelungsmittel eine Gasdruckfeder (17) umfaßt, die durch Betätigung eines Ventils in eine erste Position bei einem Winkelwert der auf eine ausgewählte Höhenposition eingestellten Beinglieder gesperrt werden kann, so daß die Position des oberen rahmenartigen Teils und damit die Position der Tischplatte gegenüber einer darunter liegenden Stützplatte aufrechterhalten werden kann, wobei das Ventil auf eine zweite Position eingestellt werden kann, in der die Gasdruckfeder zur erneuten Einstellung der Höhe des oberen rahmenartigen Teils (1) freigegeben wird; daß das Ventil über einen Stift (20), der sich durch eine mit der Gasdruckfeder verbundene und mit einem im oberen rahmenartigen Teil (1) angebrachten Haltemittel (23) schwenkbar verbundene Durchführung erstreckt, zwischen der ersten und der zweiten Position geschaltet werden kann; und daß der Stift (20) über ein schwenkbar mit dem Haltemittel (23) verbundenes Betätigungsmittel (24), das zur betätigbaren Zusammenwirkung mit dem Stift (20) eine konkave Ausnehmung (29) aufweist, in Längsrichtung bewegt werden kann.

2. Gestell nach Anspruch 1, dadurch gekennzeichnet, daß der Zylinder der Gasdruckfeder mittels der Durchführung (21) am oberen rahmenartigen Teil (1) befestigt ist.

3. Gestell nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß der Gasdruckfederzylinder (19) den mittig positionierten Stift (20) stützt, der dazu bestimmt ist, daß in der Gasdruckfeder angebrachte Ventil entweder auf die erste Ventileinstellung

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oder die zweite Ventileinstellung als Reaktion auf von dem Betätigungsmittel (24) erzeugte Drehbewegung zu verstellen.

4. Gestell nach Anspruch 1, dadurch gekennzeichnet, daß die Gasdruckfeder (17) ein oberes Teil (19), das auf einer Seite einer vertikalen Ebene, die durch den Drehzapfen (12) geht, schwenkbar mit dem oberen rahmenartigen Teil (1) verbunden ist, und ein unteres Teil (18), das auf der gleichen Seite der vertikalen Ebene wie das obere Teil (19) und unterhalb des Drehzapfens (12) schwenkbar mit dem Beinglied (3) verbunden ist, aufweist.

5. Gestell nach Anspruch 1, dadurch gekennzeichnet, daß ein Drehzapfen zur Schwenkbewegung des Betätigungsmittels (24) im Haltemittel (23) neben dem Durchführungsdrehzapfen (22) angebracht ist.

6. Gestell nach Anspruch 5, dadurch gekennzeichnet, daß das Betätigungsmittel (24) ein rückwärtiges Teil in Form eines Griffes (26) und ein vorderes Teil (27), das zur Zusammenwirkung mit dem Stift (20) über die konkave Ausnehmung (29) bestimmt ist, enthält.

7. Gestell nach Anspruch 1, dadurch gekennzeichnet, daß die Ausnehmung (29) allgemein 90° eines Kreisbogens einschließt.

8. Gestell nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß jedes der beiden Beinglieder (2,3) zwei allgemein parallele Stäbe (4,5;6,7) enthält, die beide an ihren unteren Teilen über eine erste Querstange (8 oder 10) und an ihren oberen Teilen über eine zweite Querstange

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(9 oder 11) miteinander verbunden sind, wobei die zweiten Stangen (9,11) dazu bestimmt sind, mit dem oberen rahmenartigen Teil (1) zusammenzuwirken.

9. Gestell nach Anspruch 8, dadurch gekennzeichnet, daß das rahmenartige Teil (1) vier Balken (13-16) umfaßt, die in Form eines Rechtecks oder Quadrats angeordnet sind, wobei die einander gegenüberliegenden Balken (14,16) dazu bestimmt sind, mit den zweiten Stangen (9,11) zusammenzuwirken; und daß die beiden Balken (14,16) einen U-förmigen Querschnitt aufweisen, wobei die Beine des einen Balkens zu den Beinen des anderen Balkens hin weisen.

10. Gestell nach Anspruch 9, dadurch gekennzeichnet, daß einer der zweiten Stäbe (9) schwenkbar mit den Balken (14,16) verbunden ist, während der zweite Stab (11) an seinen beiden Enden mit einem geeigneten Mittel versehen ist, um zu ermöglichen, daß die U-förmigen Teile in den beiden Balken (14,16) gleiten können.

11. Gestell nach Anspruch 9, dadurch gekennzeichnet, daß ein Balken (15) dazu bestimmt ist, parallele Balken (14,16) an einem ihrer beiden Enden miteinander zu verbinden, so daß sich der Balken (15) allgemein senkrecht zu diesen Balken erstreckt; und daß das Haltemittel (23) allgemein gegenüber dem Balken (15) angebracht ist und eine Verlängerung aufweist, die nach innen zum Mittelpunkt des oberen rahmenartigen Teils weist.

...

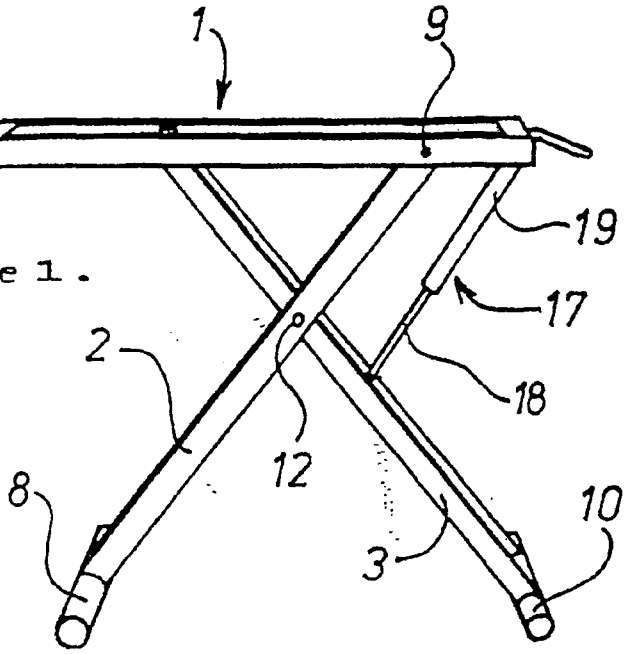
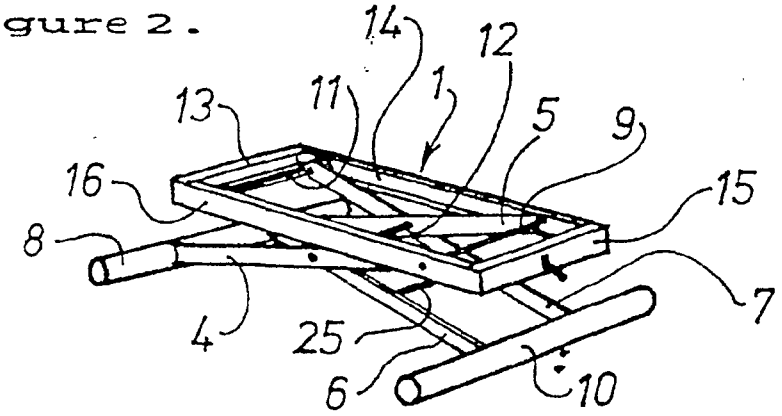


Figure 1.

Figure 2.



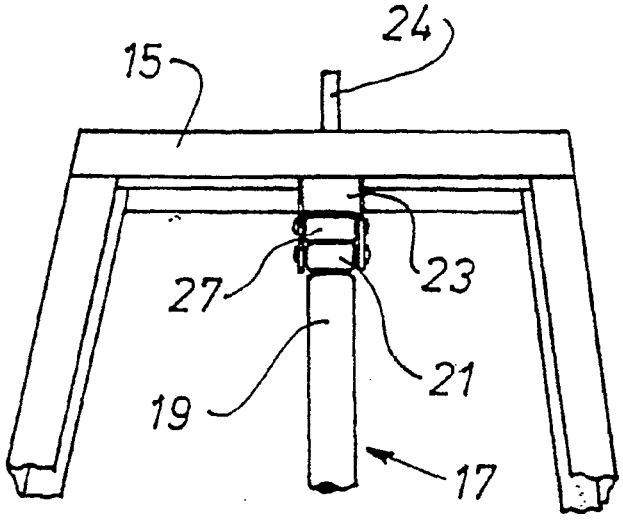
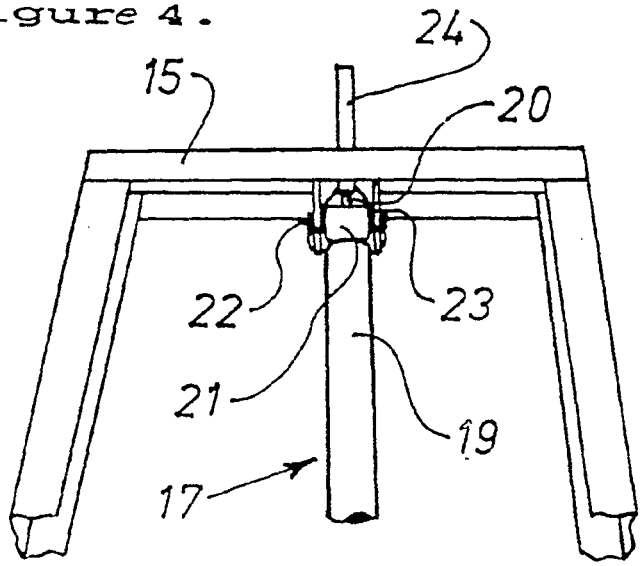


Figure 3.

Figure 4.



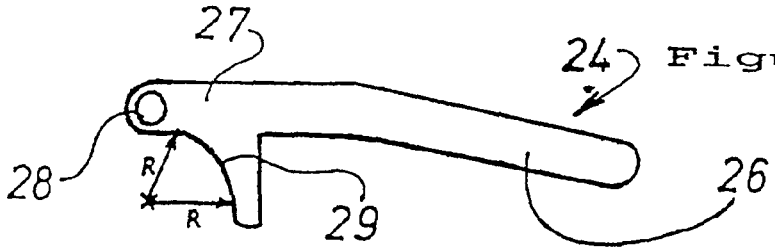


Figure 5.

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(Not for submission under 37 CFR 1.99)

Application Number	17493830
Filing Date	2021-10-04
First Named Inventor	Nathan Mark Poniatowski
Art Unit	3637
Examiner Name	Janet Marie WILKENS
Attorney Docket Number	1001-001US13

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A certification statement is not submitted herewith.

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Signature	/Daniel T. Lund/	Date (YYYY-MM-DD)	2023-04-23
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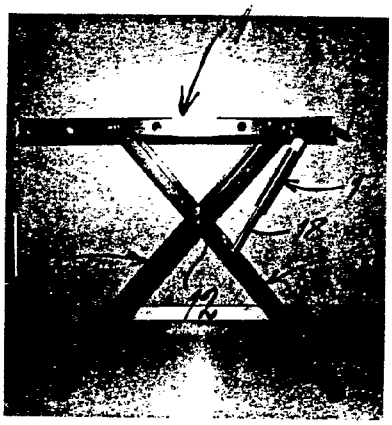
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(57) Abstract

The present invention relates to a table stand for use preferably in caravans and motorhomes, wherein the top of the stand is provided with a frame-like part on which a tabletop is intended to be placed and which is adjustable in the height direction so that the tabletop can be adjusted vertically to different positions. According to the invention, the inventive stand is characterized by the following combination of features: the stand includes at leat two leg members (2, 3) which are hinged or pivotally connected together such as to enable the parts of leg members located on mutually opposite sides of the hinge or pivot (12) to be moved towards and away from one another in a scissor-like fashion; each leg member (2, 3) has at each end thereof a transverse rod (8, 9; 10, 11), of which the lowermost rod (8; 10) functions to support the stand against an underlying supporting surface, whereas the upper rods (9; 11) coact with the frame-like part (1) in a manner such that the parts of the two leg members (2, 3) located on opposite sides of the pivot can be moved towards and away from each other so as to raise or lower the frame-like part (1) in relation to the underlying supporting surface; a gas-spring, or piston-cylinder device (17), so arranged in the stand as to enable the frame-like part (1) of said stand to be adjusted vertically, both downwardly and upwardly, wherein the gas-spring can be blocked in the set position so as to maintain the position of the frame-like part and therewith the position of the tabletop in relation to the underlying supporting surface.

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STAND

The present invention relates to a table stand intended for use preferably in caravans and motorhomes, wherein the stand supports at the top thereof a frame-like part on which a tabletop is intended to be placed and which can be adjusted vertically so as to position the tabletop in different height positions.

The tables provided in caravans/motorhomes normally have the form of a tabletop which is fitted to the top of a stand. This type of table is normally intended for two different purposes. Firstly, the table is intended for use as a conventional dining table, from which food and coffee can be partaken in the caravan/motorhome. Secondly, the table shall be capable of being raised and lowered, so as to enable the tabletop to be lowered to a position in which it will function as part of a bed in the caravan/motorhome. Lowering and raising of the table has hitherto been a complicated process, and consequently time-consuming.

The object of the present invention is to eliminate this problem and to provide a tabletop stand which can be readily handled and manoeuvred when lowering and raising the same. This object has been achieved with a stand of the aforesaid kind which is characterized by the following combination of features:

- The stand includes at least two leg members which are hinged or pivotally connected together such as to enable the parts of said leg members located on mutually opposite sides of the hinge or pivot to be moved towards and away from one another in a scissor-like fashion;

- Each leg member has at each end thereof a transverse rod, of which the lowermost rod functions to support the stand against an underlying supporting surface, whereas the upper rods coact with the frame-like part in a manner such that the parts of the two leg members located on opposite sides of the hinge or pivot can be moved towards and away from each other so as to raise or lower the frame-like part in relation to the underlying supporting surface;

- A gas-spring, or piston-cylinder device, so arranged in the stand as to enable the frame-like part of said stand to be adjusted vertically, both downwardly and upwardly, wherein the gas-spring can be blocked in its position, so as to maintain the position of the frame-like part and therewith the position of the tabletop in relation to the underlying supporting surface. This enables the frame-like part, and therewith the tabletop, to be adjusted continually to any selected vertical position, in which position the gas-spring is locked.

A preferred embodiment of the invention will now be described in more detail with reference to the accompanying drawings, in which Figure 1 shows the inventive stand in a raised position and provided with a lockable gas-spring and a spring operating or activating means; Figure 2 illustrates the stand of Figure 1 in a lowered position; Figure 3 and Figure 4 show the attachment of the gas-spring to the upper part of the stand, wherein Figure 4 shows the attachment from beneath; and Figure 5 illustrates the construction of the operating means.

Figures 1 and 2 illustrate the inventive stand. The stand includes a frame-like part 1 which is carried by two leg members 2, 3. Each leg member 2, 3 includes two substantially parallel rods or bars 4, 5; 6, 7, wherein the two bars of each pair of bars are spaced from one another and are connected together at both ends thereof by means of a respective transverse rod 8, 9; 10, 11, wherein the lowermost transverse rods 8; 10 function to support the stand against the underlying support surface and wherein the upper, transverse rods 9; 11 are intended to coact with the frame-like part 1. The two leg members 2, 3, i.e. the pairs of bars 4, 5; 6, 7 are mutually connected by means of a hinge means or pivot in the form of a transverse rod 12, which extends through the bars approximately midway therealong the rods, preferably at a location which is slightly above centre. This enables the two ends of respective pairs of bars 4, 5; 6, 7 to be moved towards and away from each other in a scissor-like fashion and therewith move the frame-like part 1 vertically.

The frame-like part 1 and bars of the illustrated embodiment are made of varnished or lacquered steel plate and the frame-like part includes four bars 13-16 disposed in the form of a rectangle. The stand may, of course, be made of some other material and the frame-like part 1 may have the form of a square. At least two of the frame bars, the longitudinally extending bars 14, 15 of the illustrated embodiment have a substantially U-shaped cross-section with the legs of the U facing inwards. The upper transferse rods 9, 11 of the two leg members 2, 3 are intended for coaction with the frame bars 14, 15. The one rod 9 is pivotally mounted in the bars 14, 15, whereas the other transverse rod 11 is provided at both ends with suitable means for

sliding in the U-shaped part of the bars in order to achieve the aforesaid scissor-like movement of the leg members.

An essential feature of the invention is that a blockable gas-spring 17, or piston-cylinder device, is provided for enabling the position of the frame-like part 1 to be adjusted vertically in a smooth continuous fashion, both in an upward and in a downward direction. The gas-spring includes a bottom part 18 which is pivotally connected to the leg member 3 beneath the pivot rod 12, and an upper part 19 which is pivotally connected to the transverse frame-bar 15 on the same side of a vertical plane passing through the rod 12 as the lower part 18 (see also Figures 3, 4).

The gas-spring 17 is provided with a centrally positioned pin 20 which protrudes slightly from the upper part 19 of the gas-spring in an axial direction. This pin 20 is intended to activate a release valve provided within the gas-spring.

The pin 20 is intended to coact with a cylindrical bushing 21 which is pivotally connected to a holder means 23, by means of screws 22 or the like, said holder means being mounted on the inside of the frame bar 15. The pin 20 thus extends straight through the bushing 21 in its transverse direction and protrudes slightly beyond the bushing for coaction with an operating means or activator 24 (see also Figure 5). Because the bushing 21 is pivotally connected to the holder means 23 and because the bottom part 18 of the gas-spring 17 is pivotally connected to the leg member 3, the gas-spring will take different angular positions in relation to the frame-like part 1 of the stand and the

leg member 3. According to this embodiment, the leg member 3 includes two parallel bars or rods 6, 7. The bottom part 18 of the gas-spring 17 is therewith pivotally connected to a transverse rod 25, which mutually connects the bars or rod 6, 7 and which is positioned beneath the hinge or pivot rod 12.

The operating means 24 has an elongated shape and has a handle 26 provided on the rear thereof and a part 27 which functions to engage the end of the pin 20 on the front thereof. The part 27 is provided with a hole 28 by means of which the operating means is pivotally conencted to the holder means 23 substantially immediately above the pivot 22 for attachment of the bushing 21. The position of the pivot 22 has been referenced x in Figure 5. The forward part 27 of the operating means 24 is also provided with a concave recess 29 which is intended to abut the end of the pin 20 and which includes substantially 90° of a circle. The radii R of the recess 29 are therewith essentially the same, taken from the x. One important advantage afforded hereby is that the force exerted on the pin 20 by the operating means will act substantially in the longitudinal direction of the pin, irrespective of the height position of the stand, i.e. irrespective of the angle between the operating means 24 and the longitudinal axis line of the pin 20. This fact enables the gas-spring 17 to be operated effectively. When the pin 20 is pressed inwardly by means of the operating means 24, the release valve in the gas-spring will open. The gas-spring is thereby compressed with a force which is greater than the resistance exerted by the gas-spring, which takes place when the stand is to be pressed down to a low level. If it is wished to maintain the stand at this low level, the pressure on the pin is removed, thereby

causing the pin to return to its starting position. This closes the release valve in the gas-spring and the spring will thereby be blocked and function as a rigid rod. When wishing to raise the stand, the pin 20 is pressed-in by means of the operating means 24, thereby raising the frame part of the stand to the desired position, whereafter the pressure on the pin 20 is removed.

It will be understood that the invention is not restricted to the described embodiment and that modifications can be made within the scope of the following Claims. For instance, each leg member may consist of a single rod instead of two mutually connected rods, as illustrated in the described embodiment.

Claims

1. A table stand for use preferable in caravans and motorhomes, wherein the top of the stand is provided with a frame-like part on which a tabletop is intended to be placed and which is adjustable vertically so as to enable the tabletop to be adjusted to different vertical heights, c h a r a c t e r i z e d by the following combination of features;

- The stand includes at least two leg members (2, 3) which are hinged or pivotally connected together such as to enable the parts of said leg members located on mutually opposite sides of the hinge or pivot (12) to be moved towards and away from one another in a scissor-like fashion;

- Each leg member (2, 3) has at each end thereof a transverse rod (8, 9; 10, 11), of which the lowermost rod (8; 10) functions to support the stand against an underlying supporting surface, whereas the upper rods (9; 11) coact with the frame-like part (1) in a manner such that the parts of the two leg members (2, 3) located on opposite sides of the pivot can be moved towards and away from each other so as to raise or lower the frame-like part (1) in relation to the underlying supporting surface;

- A gas-spring, or piston-cylinder device (17), so arranged in the stand as to enable the frame-like part (1) of said stand to be adjusted vertically, both downwardly and upwardly, wherein the gas-spring can be blocked in a set position so as to maintain the position of the frame-like part and therewith the position of the tabletop in relation to the underlying

supporting surface.

2. A stand according to Claim 1, c h a r a c - t e r i z e d in that the gas-spring (17) has an upper part (19) which is pivotally connected to the frame-like part (1) on one side of a vertical plane which passes through the pivot (12), and a lower part (18) which is pivotally connected to the leg member (3) on the same side of said vertical plane as the upper part (19) and beneath the pivot (12).

3. A stand according to Claim 2, c h a r a c - t e r i z e d in that the gas-spring (17) is provided with a centrally located pin (20) which projects slightly beyond the upper part (19) of the gas-spring in its longitudinal direction and which is intended to activate a release valve located the gas-spring (17).

4. A stand according to Claim 3, c h a r a c - t e r i z e d in that the pin (20) passes transversely through a bushing (21) which is pivotally connected to a holder means (23) mounted in the frame-like part (1); and in that the pin (20) is intended to be activated by means of an operating means (24) which is pivotally connected to the holder means (23).

5. A stand according to Claim 4, c h a r a c - t e r i z e d in that the pivot for the operating means (24) in the holder means (23) is arranged substantially immediately above the pivot (22) for the bushing (21).

6. A stand according to Claim 5, c h a r a c - t e r i z e d in that the operating means (24) includes a rear part in the form of a handle (26) and a

front part (27) which is intended for coaction with the pin (20); and in that said part is provided with a concave recess (29).

7. A stand accroding to Claim 6, c h a r a c - t e r i z e d in that the recess (29) includes substantially 90° of a circle; and in that the radii of the recess are substantially the same, taken from the pivot (22) referenced X.

8. A stand according to any one of the preceding Claims, c h a r a c t e r i z e d in that each leg member (2, 3) includes two substantially parallel bars (4, 5; 6, 7) which are mutually connected at the bottom thereof by the transverse rod (8; 10) and at the top thereof by the transverse rod (9; 11), said upper rods (9; 11) being intended for coaction with the frame-like part (1).

9. A stand according to Claim 8, c h a r a c - t e r i z e d in that the frame-like part (1) comprises four bars (13-16) which are disposed in the shape of a square or a rectangle, wherein two mutually opposite bars (14, 16) are intended for coaction with the upper rods (9; 11); and in that said two bars (14, 16) have a U-shaped cross-section, wherein the legs of the U of the one bar are directed towards the legs of the U on the other bar (16).

10. A stand according to Claim 9, c h a r a c - t e r i z e d in that the one (9) of said two upper rods is pivotally connected to the bars (14, 16), whereas the other (11) of said two upper rods is provided at both ends thereof with suitable means for

enabling sliding in the U-shaped part of the two bars (14, 16).

11. A stand according to Claim 10, in which the bar (15) connects the bars (14, 16) at one of their two ends and thus extend substantially at right angles to said bars, c h a r a c t e r i z e d in that the holder means (23) is disposed substantially opposite the bar (15) and has an extension inwardly towards the centre of the frame-like part.

Figure 1.

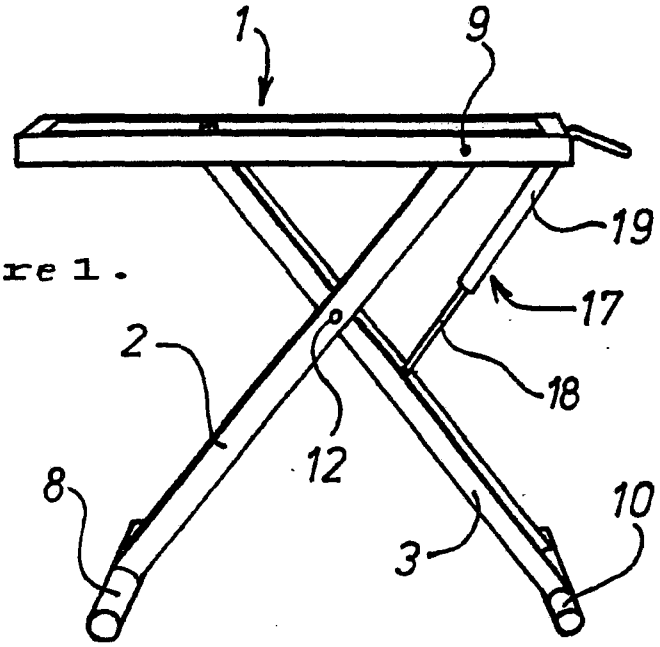
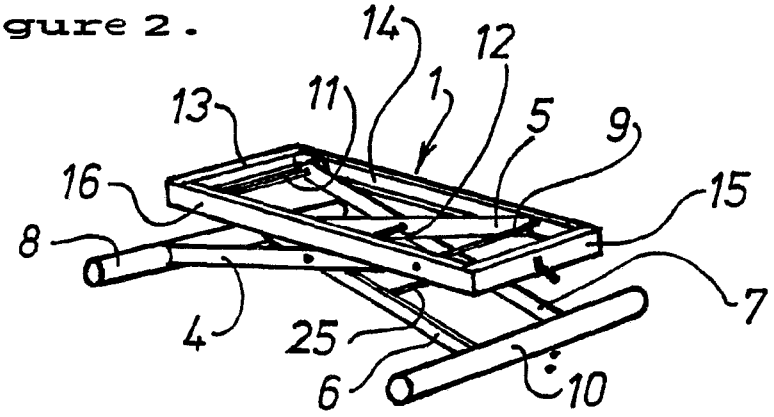


Figure 2.



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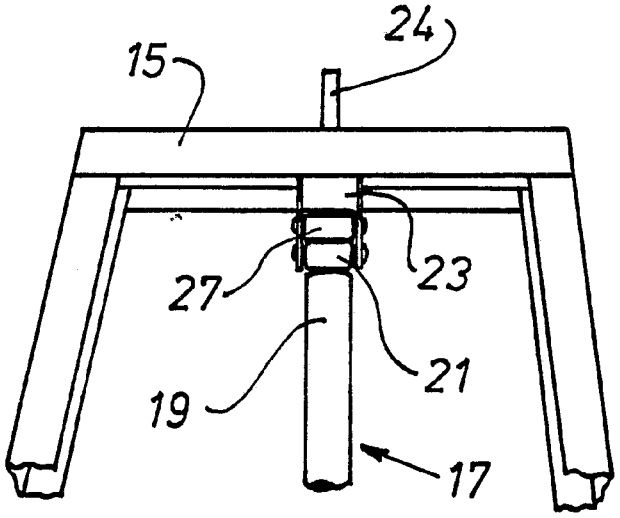
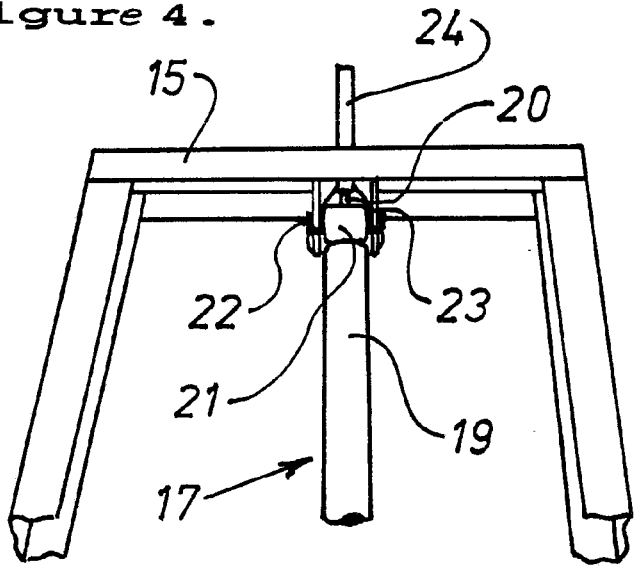


Figure 3.

Figure 4.



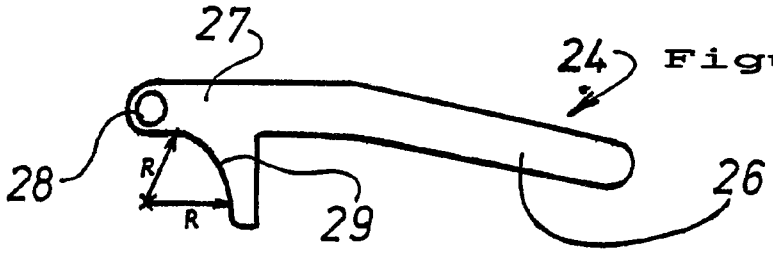


Figure 5.

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INTERNATIONAL SEARCH REPORT

International Application No PCT/SE 91/00364

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all)[6]

According to International Patent Classification (IPC) or to both National Classification and IPC

IPC5: B 60 P 3/36, A 47 B 9/16

II. FIELDS SEARCHED

Minimum Documentation Searched[7]

Classification System	Classification Symbols
IPC5	B 60 P; A 47 B

Documentation Searched other than Minimum Documentation to the Extent that such Documents are included in Fields Searched[8]

SE,DK,FI,NO classes as above

III. DOCUMENTS CONSIDERED TO BE RELEVANT[9]

Category *	Citation of Document,[11] with indication, where appropriate, of the relevant passages[12]	Relevant to Claim No.[13]
Y	DE, A1, 3104182 (ROSSINI, GIOVANNI, MOZZANICA & CAPETTI, AUGUSTO, CARAVAGGIO) 24 December 198 , see the whole document --	1-6,8-11
Y	DE, B, 1261990 (OLGA EMILIE EGGER ET AL) 29 February 1968, see the whole document --	1-6,8-11
Y	DE, A1, 3439422 (BRUNN, OSWALD) 30 April 1986, see the whole document --	1-6,8-11
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IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
14th August 1991	1991 -08- 19
International Searching Authority	**Signature of Authorized Officer**
SWEDISH PATENT OFFICE	Hans Nordström

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III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)

Category *	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No
Y	US, A, 4558648 (FRANKLIN ET AL.) 17 December 1985, see the whole document -- --------	1-6,8-11

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO.PCT/SE 91/00364

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE-A1- 3104182	81-12-24	NONE	
DE-B- 1261990	68-02-29	NONE	
DE-A1- 3439422	86-04-30	NONE	
EP-A2- 0133523	85-02-27	DE-A- 3470451	88-05-26
US-A- 4558648	85-12-17	CA-A- 1233461	88-03-01
		EP-A- 0142919	85-05-29
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(54) Title: A HEIGHT-ADJUSTABLE DESKTOP STAND

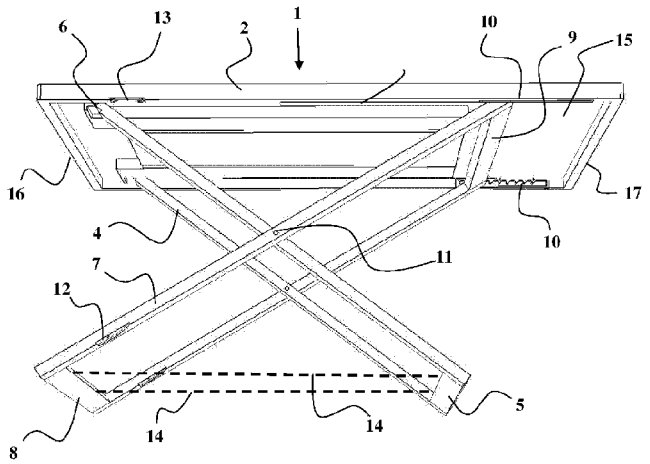


Fig.2

(57) Abstract: The present invention relates to a height adjustable desktop stand. The height adjustable desktop stand comprises: a platform (2); a first and a second leg element (4, 7) pivotally connected to each other forming a configuration as a pair of scissors, wherein the first leg element (4) at a first end (6) thereof is pivotally connected to the platform (2), and wherein the second leg element (7) at a first end (9) thereof is adapted to be connected to the platform (2) via a locking arrangement (10) having a plurality of locking positions; and a spring element (14; 18; 24) connected between on the one hand the second leg element (7) and on the other hand the first leg element (4) or the platform (2) and being adapted to force the first end (9) of the second leg element (7) in a direction towards the first end (6) of the first leg element (4).

WO 2016/200318 A1

A HEIGHT-ADJUSTABLE DESKTOP STAND

Technical field

The present invention relates to a height adjustable desktop stand.

Background

An ergonomic environment is intended to maximize productivity by reducing operator fatigue, discomfort and health issues. More and more people realize the risks involved with sitting down behind a desk for longer periods of time. The static position of sitting down can lead to back and neck pains as well as mental tiredness and an increased risk for so-called "sitting diseases."

By standing up behind the desk, the above mentioned risks can be reduced. Standing up also leads to more calories burned with more energy and better focus as a result. The optimal way for a healthy working practice is to vary working positions between standing up and sitting down.

Most height-adjustable work spaces come as complete desks that are too expensive for the ordinary user. Unfortunately, there are few good options for desktop stands that are height-adjustable while being cheap and easy to use. There is also a need for mobility and being able to stand and work where there is only an ordinary desk available.

Summary of the invention

In view of the above, it is an object of the present invention to solve at least one of the problems mentioned above.

In particular, according to a first aspect a height-adjustable desktop stand is provided. The height adjustable desktop comprises: a desktop, a first and a second leg element pivotally connected to each other forming a configuration as a pair of scissors, wherein the first leg element at a first end thereof is pivotally connected to the desktop, and wherein the second leg element at a first end thereof is adapted to be connected to the desktop via a locking arrangement having a plurality of locking positions, and a spring

element connected between on the one hand the second leg element and on the other hand the first leg element or the desktop and being adapted to force the first end of the second leg element in a direction towards the first end of the first leg element.

The height-adjustable desktop stand may be used in many different situations. It is possible to adjust the height of the desktop with a relatively light use of force even though the desktop is weighed down by for example a computer. Meanwhile the locking arrangement ensures that the desktop stays at a desirable working height. The height-adjustable desktop stand may in its fully folded position easily be moved between different use-places and takes up little space when storing. The height-adjustable desktop stand provide the user to be able to work both while standing up and sitting down without the need of removing devices and or other things placed on the platform. An ergonomic sitting position is enabled by the flatness of the desktop stand when it is in the bottom position.

Each of the plurality of locking positions may correspond to a specific height of the height adjustable desktop stand.

The spring element may on the one hand be connected at a second end of the first leg element and on the other hand at a second end of the second leg element. By doing so, the load is lightened, making it easier to adjust the height of the desktop.

In order to form the plurality of the locking positions, the locking arrangement may comprise a toothed rack comprising a plurality of teeth. The second leg element may comprise an engager arranged to engage with different teeth of the toothed rack.

The teeth of the toothed rack may be shark-fin shaped.

The space between the teeth of the toothed rack may further be U-shaped.

A further scope of applicability of the present invention will become apparent from the detailed description given below. However, it should be understood that the detailed description and specific examples, while indicating preferred embodiments of the invention, are given by way of illustration only, since various changes and modifications within the scope of

the invention will become apparent to those skilled in the art from this detailed description.

Hence, it is to be understood that this invention is not limited to the particular component parts of the device described or steps of the methods described as such device and method may vary. It is also to be understood that the terminology used herein is for purpose of describing particular embodiments only, and is not intended to be limiting. It must be noted that, as used in the specification and the appended claim, the articles "a," "an," "the," and "said" are intended to mean that there are one or more of the elements unless the context clearly dictates otherwise. Thus, for example, reference to "a unit" or "the unit" may include several devices, and the like. Furthermore, the words "comprising", "including", "containing" and similar wordings does not exclude other elements or steps.

Brief Description of the Drawings

The above and other aspects of the present invention will now be described in more detail, with reference to appended drawings showing embodiments of the invention. The figures should not be considered limiting the invention to the specific embodiment; instead they are used for explaining and understanding the invention.

As illustrated in the figures, the sizes of layers and regions are exaggerated for illustrative purposes and, thus, are provided to illustrate the general structures of embodiments of the present invention. Like reference numerals refer to like elements throughout.

Fig. 1 illustrates a side view of a height-adjustable desktop stand.

Fig. 2 illustrates a perspective view of the height-adjustable desktop stand according to Fig. 1

Fig. 3 illustrates a view from below of an alternative height-adjustable desktop stand.

Fig. 4 illustrates a perspective view of yet an alternative height-adjustable desktop stand.

Detailed description

The present invention will now be described more fully hereinafter with reference to the accompanying drawings, in which currently preferred embodiments of the invention are shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided for thoroughness and completeness, and to fully convey the scope of the invention to the skilled person.

Figs 1 and 2 illustrate a height-adjustable desktop stand 1. As shown in Fig. 1 the height-adjustable desktop stand 1 may be placed on a surface 23. The surface 23 may e.g. be a desktop of a desk or table. The height-adjustable desktop stand 1 comprises a platform 2, and a pair of leg elements 4, 7.

The pair of leg elements 4, 7, comprises a first leg element 4 and a second leg element 7. The first and second leg elements 4, 7 are pivotally connected to each other at a pivoting joint 11. Hence, the first and second leg elements 4, 7 are forming a configuration as a pair of scissors. The first leg element 4 is at a first end 6 thereof pivotally connected to the platform 2. The second leg element 7 is at a first end 9 thereof adapted to be connected to the platform 2 via a locking arrangement 10. The locking arrangement 10 is having a plurality of locking positions. The locking arrangement 10 comprises a toothed rack comprising a plurality of teeth. Each teeth in the toothed rack corresponds to one of the locking positions of the locking arrangement 10. An engager of the second leg element 7 is arranged to engage the teeth of the toothed rack in order to set the locking arrangement 10 in a specific locking position. The engager is arranged at the first 9 end of the second leg element 7.

The height-adjustable desktop stand 1 is adjustable in height by setting the positioning of the engager in the locking arrangement 10. A plane can be defined between the first end 6 of the first leg element 4 and the first end 9 of the second leg element 7. The plane is parallel with the platform 2. When lifting a first end 17 of the platform 2, the teeth of the toothed rack in the locking arrangement 10 are elevated from the engager. The engager is then

free to move in a rail beneath the teeth. The locking arrangement 10 is located at the first end 17 of the platform 2. By moving the platform 2 perpendicular in relation to the plane, the height is adjusted. That is, the platform is moved in the vertical direction in relation to the surface 23. Depending on the weight of objects on top of the platform 2, different forces may be required to be applied in order to adjust the height of the platform 2. When the platform 2 is positioned at a desired height, the first end 17 of the platform 2 is lowered. Lowering the first end 17 of the platform 2 makes the engager to engage with the tooth rack. This places the engager in one of the plurality of locking positions of the locking arrangement 10. The engager is an element arranged to engage with the teeth of the toothed rack. Non-limiting examples of engagers are a dowel or a peg.

Hence, the height-adjustable desktop stand 1 may be lifted and/or lowered to a desired lateral height. This is done by a user holding her hands at the first end 17 and a second end 16 of the platform 2. By manipulating the first end 17 of the platform 2 the user may remove the engager from a locking position of the locking arrangement 10 and thereafter move the platform 2 up and/or down to a desired level of height. Well at the desired level of height the user manipulates the first end 17 of the platform 2 again such that the engager engage with the locking arrangement 10 for locking the height-adjustable desktop stand 1 at the desired level of height.

In one embodiment, the teeth of the toothed rack in the locking arrangement 10 may have a shark-fin shaped profile. A shark-fin profile is understood to comprise a 90 degree or more angle between the tooth and the base of the toothed rack on one side of the tooth, and an angle of 90 degrees or less between said tooth and base of the toothed rack on the other side of the tooth.

By having shark-fin shaped profile, the engager is more securely positioned in the locking position. By having a rounded shape on one side of the tooth, the engager can move easily in one direction under the teeth of the toothed rack 10.

In another embodiment, the space between the teeth of the toothed rack may have a U-shaped profile. A U-shaped space between the teeth of

the toothed rack ensures a safe locking of the engager to the teeth of the toothed rack.

In one embodiment, illustrated in Fig.2, the leg elements 4, 7 may comprise two leg pairs. At a second end 5, 8 of the corresponding leg element 4, 7 the two leg pairs may be connected by one or more stays. The stays may be positioned at any given position inside a leg pair. The stay may be designed to affect the friction against the surface 23. The second end of the first leg element 4 and the second end of the second leg element 7 may be designed to have an increased friction against the surface 23. The friction between the leg elements 4, 7 and the surface 23 affects the lateral force required to push the desktop down. The friction between the leg elements 4, 7 and the surface 23 also affects the force of which the leg elements 4, 7are being pulled together, as described below.

In another embodiment at least one of the elements 4, 7 may comprise a slab or a board.

A person skilled in the art could think of other shapes and combinations of leg element to further control the properties of the leg elements with regards to stability and strength, for example by including a truss like structure and by using various materials.

The height-adjustable desktop stand 1 further comprises a spring element. In the in Figs 1 and 2 shown embodiment the spring element 14 is on the one hand connected at the second end 5 of the first leg element 4 and on the other hand at the second end 8 of the second leg element 7. However, as will be illustrated in connection with Figs 3 and 4, other configurations of spring elements may also be applicable.

The spring element 14 of the embodiment of Fig. 2 is connected between on the one hand the second leg element 7 and on the other hand the first leg element 4. Further, the spring element 14 is adapted to force the first end 9 of the second leg element 7 in a direction towards the first end 6 of the first leg element 4.

The height-adjustable desktop strand 1 may be pushed down to its lowest position. At his position the height-adjustable desktop stand is fully folded. A fully folded height-adjustable desktop stand can be stored away

without taking up much space. Moreover, A fully folded height-adjustable desktop stand is ergonomical to use when sitting down.

In one embodiment, the platform 2 may be designed to offer the leg elements 4, 7 a cavity 15. The cavity 15 reduces the volume of the height-adjustable desktop stand when fully folded. By this a compact design is achieved in the fully folded position. This allow for maintaining good ergonomics when a user of the height-adjustable desktop strand 1 is working in a sitting down position. Additionally, the compact design is also aesthetically pleasing.

The leg elements 4, 7 may be locked in the lowest position by a locking mechanism. The locking mechanism comprises a first and a second locking element 12, 13. The first and a second locking element 12, 13 are arranged to mate with each other. The first locking element is arranged at one of the first and second leg element 4, 7. The second locking element is arranged at the platform 2.

As discussed above, the leg elements 4, 7 may comprise two leg pairs. The two leg pairs may be connected by stays. Further, the spring element 14 may connect one stay of the first leg element to the stay of the second leg element.

The person skilled in the art realizes that the present invention by no means is limited to the embodiments described above. On the contrary, many modifications and variations are possible within the scope of the appended claims.

For example, the spring element 14 may comprise an elastic material (e.g. rubber bands), a spiral spring or a gas spring.

Moreover, the area of the platform 2 may be varied. Especially the area of the platform 2 may be arranged such that a big enough working surface may be achieved.

Furthermore, as illustrated in Fig. 3, the spring element may be embodied as a spring element 18 connected between on the one hand the second leg element 7 and on the other hand the platform 2. The spring element 18 may be arranged in a cavity 22 of the platform 2. It is understood that the platform 2 does not need to be equipped with a cavity for the spring

element 18. The spring element 18 is arranged to be connected to the second leg element 7 by acting on the second leg element 7 at an interaction point 19a between the spring element 18 and the second leg element 7. The spring element 18 is arranged to be connected to platform 2 at a connection portion 19b. The spring element 18 is adapted to force the first end 9 of the second leg element 7 in a direction towards the first end 6 of the first leg element 4. This is illustrated by the arrow 21. The spring element 18 may be embodied as an elastic material (e.g. rubber bands), a spiral spring or a gas spring.

Moreover, as illustrated in Fig. 4, the spring element may be embodied as a torsion spring 24. The torsion spring 24 is arranged in connection with the pivoting joint 11.

It is to be understood that the height-adjustable desktop stand 1 may comprise one or a plurality of the different types of spring elements being discussed above. For example, in Fig. 4 the height-adjustable desktop strand 1 comprises both a spring element 18 connected between on the one hand the second leg element 7 and on the other hand the platform 2 and a torsion spring 24 is arranged in connection with the pivoting joint 11. In the shown embodiments the height-adjustable desktop strand 1 comprises a rectangular platform 2. However, it is contemplated that the platform 2 may have other shapes, such as quadratic, ellipsoidal, circular, etc.

Moreover, the platform 2 may be provided with a rim. The rim may be arranged for preventing items from fall off the platform 2.

Additionally, variations to the disclosed embodiments can be understood and effected by the skilled person in practicing the claimed invention, from a study of the drawings, the disclosure, and the appended claims.

CLAIMS

1. A height adjustable desktop stand, comprising:

a platform (2);

a first and a second leg element (4, 7) pivotally connected to each other forming a configuration as a pair of scissors

wherein the first leg element (4) at a first end (6) thereof is pivotally connected to the platform (2), and

wherein the second leg element (7) at a first end (9) thereof is adapted to be connected to the platform (2) via a locking arrangement (10) having a plurality of locking positions; and

a spring element (14; 18; 24) connected between on the one hand the second leg element (7) and on the other hand the first leg element (4) or the platform (2) and being adapted to force the first end (9) of the second leg element (7) in a direction towards the first end (6) of the first leg element (4).

2. The height adjustable desktop stand according to claim 1, wherein each of the plurality of locking positions corresponds to a specific height of the height adjustable desktop stand.

3. The height adjustable desktop stand according to claim 1 or 2, wherein the spring element (14) is on the one hand connected at a second end (5) of the first leg element (4) and on the other hand at a second end (8) of the second leg element (7).

4. The height adjustable desktop stand according to any one of claims 1 to 3, wherein, in order to form the plurality of the locking positions, the locking arrangement (10) comprises a toothed rack comprising a plurality of teeth, and the second leg element (7) comprises an engager arranged to engage with different teeth of the toothed rack.

5. The height adjustable desktop stand according to claim 4, wherein the teeth of the toothed rack are shark-fin shaped.

6. The height adjustable desktop stand according to claim 4, wherein the space between the teeth of the toothed rack is U-shaped.

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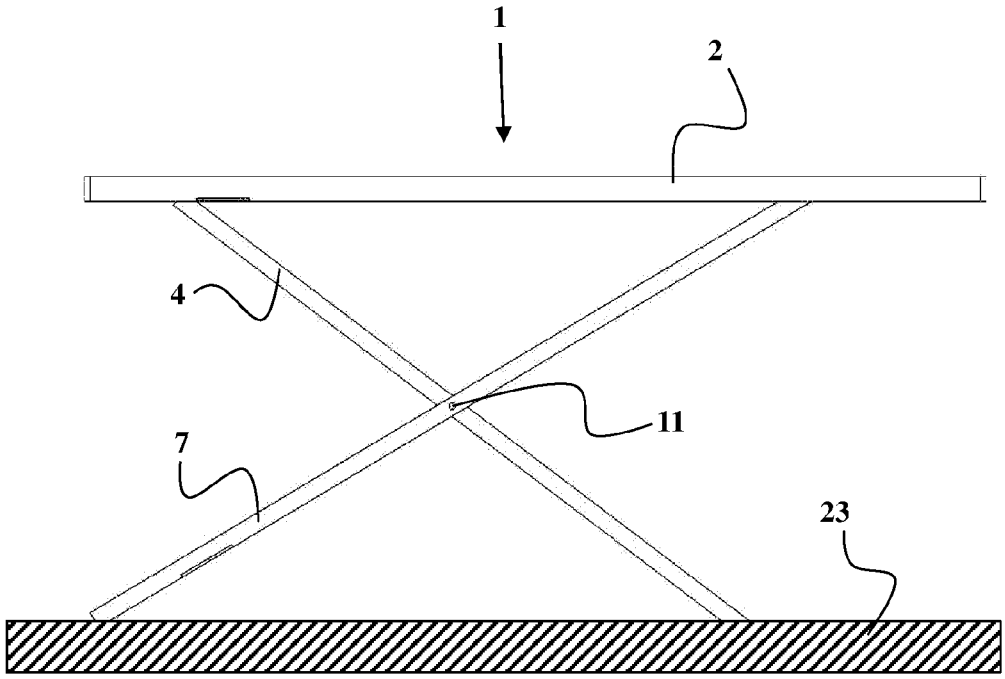


Fig.1

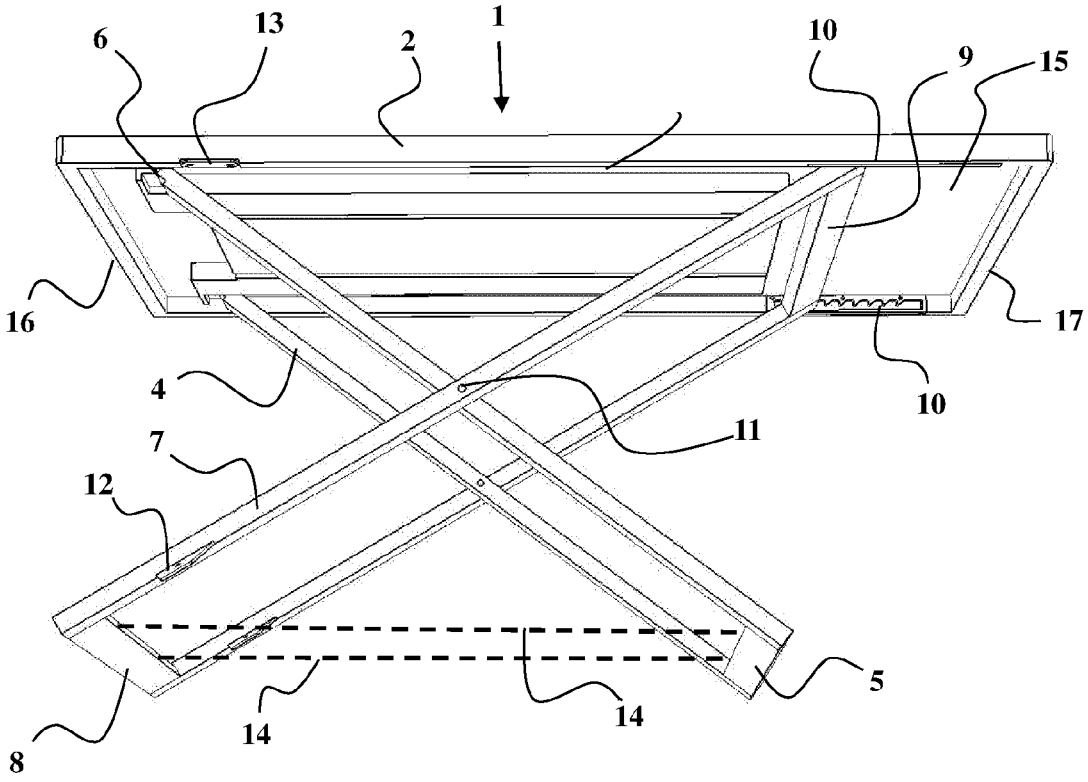


Fig.2

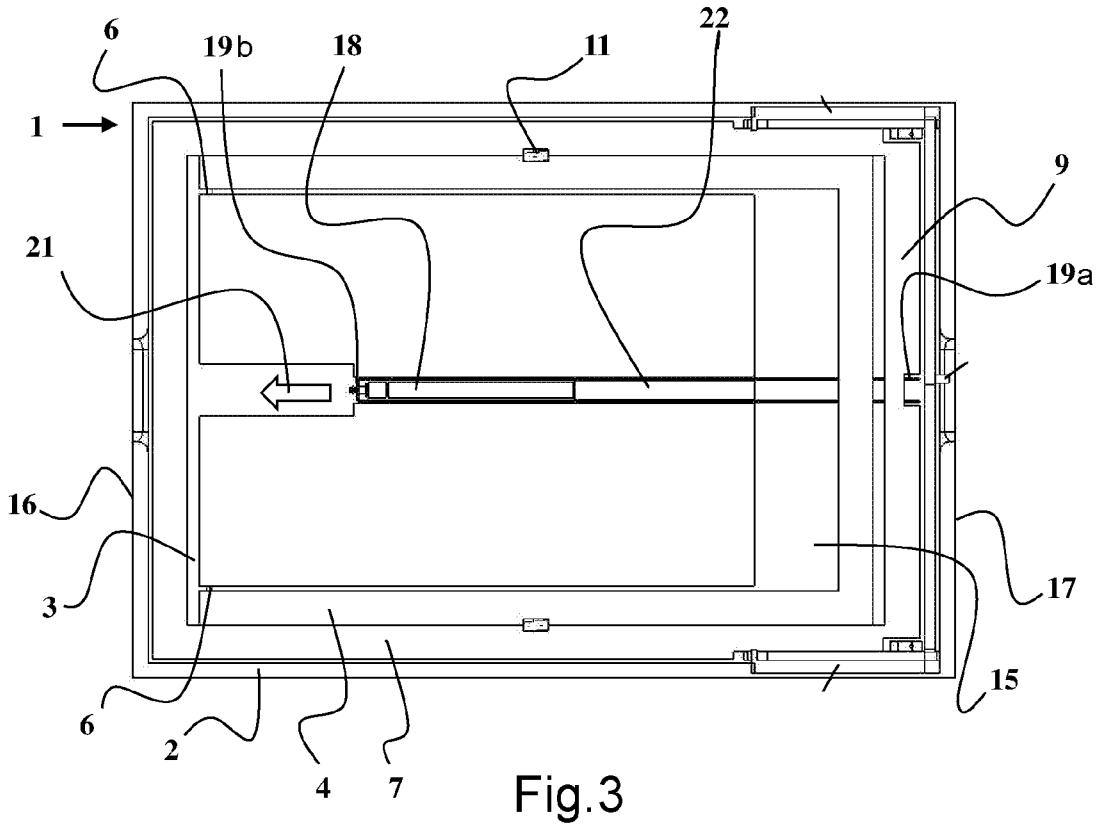


Fig.3

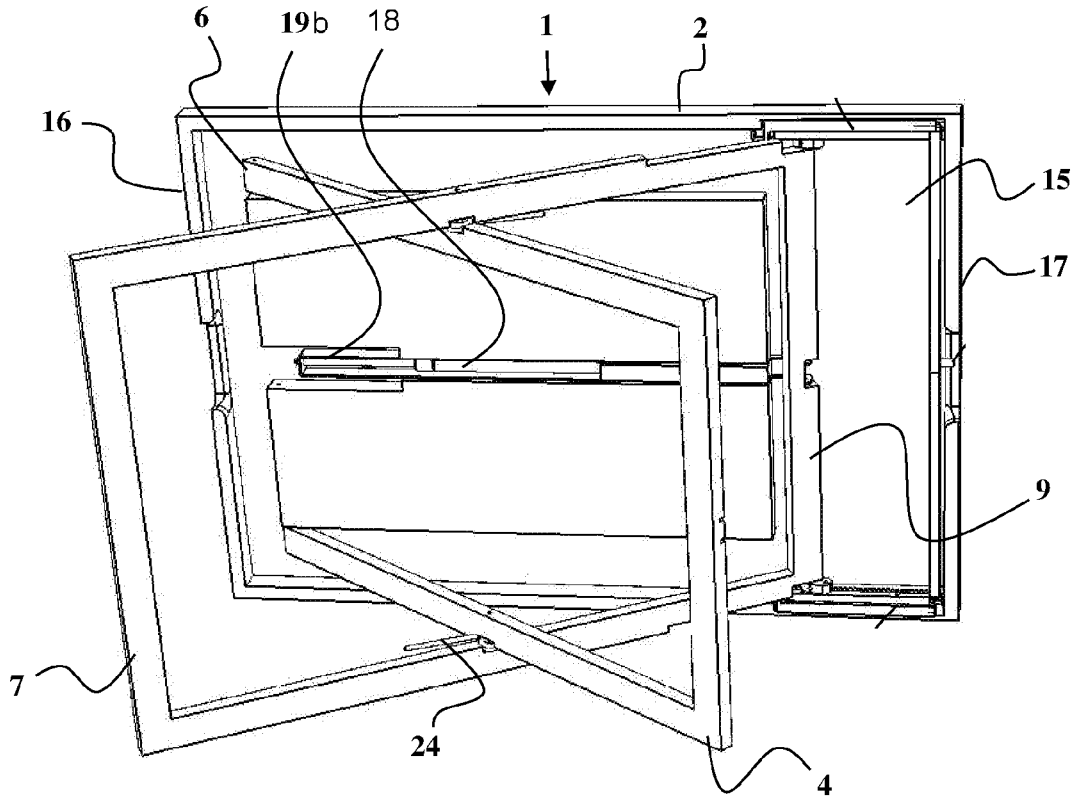


Fig.4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE2016/050539

A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: A47B, A47C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE, DK, FI, NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, PAJ, WPI data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3094948 A (CLOW GEORGE F), 25 June 1963 (1963-06-25); abstract; column 3, line 25 - column 3, line 33; figures --	1-6
X	US 4032103 A (EHRICHS WARREN A), 28 June 1977 (1977-06-28); abstract; figures --	1-6
A	US 5588377 A (FAHMIAN HAL), 31 December 1996 (1996-12-31); column 3, line 55 - column 3, line 65 --	1-6
A	US 3245366 A (MARTIN FOX), 12 April 1966 (1966-04-12); figures --	1-6

☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
22-06-2016	22-06-2016

Name and mailing address of the ISA/SE	Authorized officer
Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. + 46 8 666 02 86	Hélène Sundström Telephone No. + 46 8 782 28 00

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

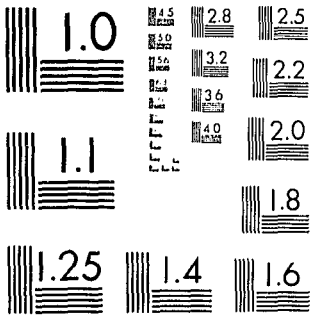
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 7246784 B1 (LOPEZ HECTOR), 24 July 2007 (2007-07-24); abstract; figures -- --------	1-6

Continuation of: second sheet

International Patent Classification (IPC)

A47B 9/16 (2006.01)
A47C 3/36 (2006.01)

US	3094948 A	25/06/1963	NONE
US	4032103 A	28/06/1977	NONE
US	5588377 A	31/12/1996	NONE
US	3245366 A	12/04/1966	NONE
US	7246784 B1	24/07/2007	NONE



MICROCOPY RESOLUTION TEST CHART
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AMENDED TRANSLATION OF PCT CH86/00150

TRANSLATOR'S AFFIDAVIT

The undersigned, being sworn, deposes and says that the undersigned is familiar with the English and German languages, and has prepared from the annexed German language document the English translation that is attached thereto; and that the English translation to the best of the knowledge and belief of the undersigned is a correct and substantial translation of the German document.

Triesen, November 21, 1986/mm

Dr. Kurt F. Büchel

Die Echtheit der Unterschrift des
Herrn Dr. Kurt F. BÜCHEL,
FL-9495 Triesen,
wird bestätigt.
Fürstl. Liechtenstein. Landgerichtskanzlei
Vaduz, den 25 NOV 1986

FÜRSTENTUM LIECHTENSTEIN STEMPELMARKE LANDGERICHT

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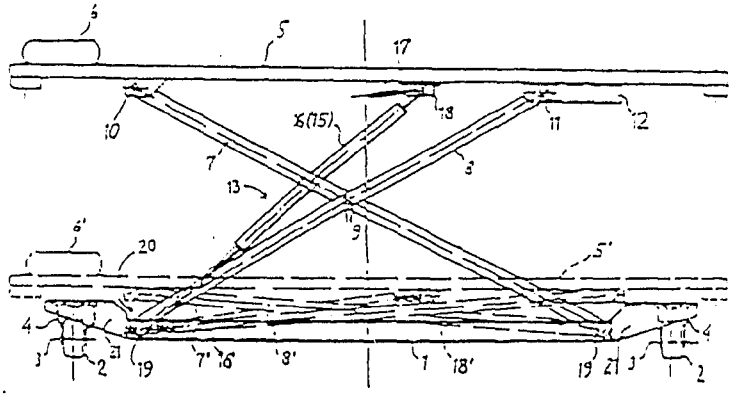
(74) Agent: BUECHEL, Kurt F.; Austrasse 4, FL-9490 Vaduz (LI).

(81) Designated States: AT (European patent), AU, BE (European patent), BR, CH (European patent), DE (European patent), FR (European patent), GB (European patent), IT (European patent), JP, LU (European patent), NL (European patent), SE (European patent), US.

(54) Title: LIFTING DEVICE

(57) Abstract

The lifting device is used in workshops, particularly in workshops for repairing motor vehicles wherein mechanics use it when they are working under the bottom side of the vehicle. The device has a moving frame (1) to which are arranged pairs of crossed guiding bars (7, 8) connected to a bearing plate (5) or the like. To said plate is hinged a spring device (13) to which is affected a stop device (17) intended to stop the device at a selected position of the plate (5). The spring device (13) is provided with at least two spring units (14, 15, 16) having a different characteristic with the aim to react with a larger force in the lower part of the motion of the plate (5) and to enable the adjustment on the device for different loads. To this aim, at least two spring units (15, 16) comprised of lockable pneumatic springs having each two chambers and a discharge valve are preferred.



Load-supporting apparatus

The invention relates to a load-supporting apparatus according to the preamble of claim 1.

Load-supporting apparatuses of this type are frequently used in workshops and especially in garages and automobile repair shops. A typical example of such a load-supporting apparatus is described in German Offenlegungsschrift 3,240,952, in which the lifting unit has at least one hydraulic cylinder. Since the connecting rods, which have a scissor-like arrangement, necessarily lead to non-linear characteristics for the loading of the lifting unit during the movement of the load-supporting apparatus - formed in this case by two rails - the said publication proposes operating the lifting unit under different pressures. This is possible without problems in the case of fluid motors of this type. However, for handling relatively small loads, for example in automobile workshops for lifting apparatuses for a mechanic lying underneath a chassis, a fluid (i.e. hydraulic or pneumatic) lifting apparatus with a fluid reservoir and pump is a relatively expensive matter.

This also applies to a design according to German Patent 2,941,454, in which, in order to avoid relatively high loading of the lifting unit at the beginning of the lifting movement, i.e. at the lower end of the path travelled by the load-supporting apparatus, the vertical piston rod of the hydraulic cylinder unit acts on the hinge point of the scissors in the middle of two connecting arms connected to one another by a hinged joint. Although this makes it possible to avoid increased loading of the lifting unit at the lower end, a load peak occurs at the upper end. In this case too, the hydraulic system would be relatively

expensive.

US-A 3 096 059 and EP-A-0 142 919, which has not previously been published, have disclosed load-supporting apparatuses of the type stated at the outset, these designs on the one hand making it possible to avoid an expensive driving hydraulics system and on the other hand providing a certain degree of compensation for the load differences arising from the connecting rod geometry, by means of an additional spring which comes into contact, only toward the end of the downward movement of the load-supporting apparatus, with its abutment on the said apparatus (US-A-3 096 059) or on the stand (EP-A 142,919). The locking apparatus is in the form of a brake in the case of the design according to the U.S. proposal, but is completely missing in the case of EP-A 142,919, because here the load-supporting apparatus need only be adjusted between a fully collapsed and a fully extended position; in fact, it is only intended to serve as a support for a television or the like. A similar application is intended in the case of the US-A too, so that in both cases the forces acting on the springs will be fairly constant.

It is the object of the invention to design a load-supporting apparatus for relatively small loads in an economical manner and in such a way that it can be adjusted for different loads. This is achieved, according to the invention, by the measures stated in the characterizing clause of claim 1.

Spring units having locking devices in the form of pneumatic springs are known per se for other purposes, for example for office chairs. The initial height from which the spring can be compressed, or the starting position from which the spring makes a relaxing movement after the locking apparatus has been unlocked, can be selected with the aid of the locking apparatus.

However, these measures alone do not mean that such a spring arrangement can be used in an expedient manner on a load-supporting apparatus of the type stated at the outset, since it is in fact the non-linear characteristic of the load in the case of a scissors movement and the adjustability to different loads which have to be taken into account; this is the purpose of the invention.

This is because the non-linear characeristic of the spring units in conjunction with the fact that the spring units are constantly connected to the bearing and abutment (and do not come into contact with a stop surface, which forms the abutment, only at the end of the lifting movement), and the adjustability of the starting position, mean that, depending on the setting, some of the forces exerted by the spring units are additive in one case and subtractive in the other, as will be evident from the description. This results in different total forces. In this case, therefore, the locking apparatus has a very different function from that of the prior art.

It would of course be possible for at least one of the springs to be in the form of, for example, a helical spring and for its bearing to be fixed at different positions, for example along an adjusting rail, in order to obtain adjustability in this way. However, this can be accomplished in a simpler manner if at least one of the spring units having a different characteristic is in the form of a pneumatic spring with a cylinder, a piston and a piston rod.

In order to be able to obtain a particularly flat spring characteristic and a large spring displacement, the two spring units, which are preferably in the form of pneumatic springs, are advantageously arranged so that they connect the stand directly to the load-

supporting apparatus. In addition or alternatively, at least one spring unit can have (for the same purpose) its bearing on one of the axles of the connecting rods, in particular on an axle connected to the stand, since this spring unit - when the load-supporting apparatus is in the extended state - assumes an inclined position, and the spring displacement is therefore longer. Moreover, this also makes it easier to accommodate the spring unit when the load-supporting apparatus is in the fully collapsed state and thus reduces the overall height of the load-supporting apparatus including the stand.

With regard to the latter purpose, it is also useful if the stand has a U-shaped depression in the middle, into which the spring units can be lowered when the load-supporting apparatus is in the lowered position. Preferably, rollers are provided underneath the upward-pointing U limbs of the stand; these rollers can be arranged, for example, adjacent to the springs lowered into the depression (instead of underneath these springs).

Further details of the invention are evident from the following description of an embodiment illustrated schematically in the drawing.

Fig. 1 shows a side view of an embodiment of a lifting apparatus in the raised position, the lowered position being indicated by dashed lines,
Fig. 2 shows a plan view of the lifting apparatus of Fig. 1, and
Fig. 3 shows a graph illustrating the spring characteristics of the spring units used in the embodiment according to Fig. 1 and 2.

A stand 1 can be moved on wheels 2. Each wheel 2 is mounted on a swivelling bolster 4 which can be rotated about an axis 3. For elevating trucks in

sewage pipes, however, the wheels may furthermore be arranged rigidly and at a suitable angle to the horizontal. A load-bearing platform 5, which serves, for example, to support a mechanic when he is working in a prostrate position underneath the chassis of a car, is mounted on the upper side of the stand 1. For this reason, the platform 5 is provided with a pillow 6.

To adapt to chassis of different heights, for example chassis of trucks and automobiles, the platform 5 should be capable of being adjusted in height. For this purpose, two pairs of connecting rods 7, 8 are fastened at their lower end to axles 19 on the stand 1 and at their upper end to the platform 5, by means of hinged joints. Both pairs of connecting rods 7, 8 are connected to one another in the form of scissors by means of a central joint 9. While the upper joint 10 of the connecting rod 7 is fastened to the platform 5, the upper joint 11 of the connecting rod 8 slides in a rail 12. If desired, it is also possible in principle to provide rails for each of the joints 10, 11. It would also be possible to provide a further pair of connecting rods at the upper end of connecting rods 7, 8 and thus form double scissors. All these parts conform to the prior art and can be varied according to the prior art.

The platform 5 can be brought from the position indicated in Fig. 1 by solid lines, where it is at its maximum height, to the lowest position, which is represented by dashed lines and in which all parts have the same reference symbols but with a prime. A spring apparatus 13, which acts as a pressure spring with respect to a load and consists of three cooperating spring units 14, 15 and 16 serves as the drive.

In order not to lose in terms of overall height as a result of the thickness of the spring units 14 - 16

when the load-supporting apparatus 5 is in the lowered position, the stand 1 is provided in the middle with a broad depression 20 resembling a U shape (cf. Fig. 1); the spring units 14 - 16 can be lowered into the said depression so that - as indicated by the dashed line - the load-supporting apparatus 5 can then rest directly on the U limbs 21. These U limbs 21 project upward to a slight extent from the lower level of the stand 1 and thus cover the rollers 2 arranged underneath.

Where spring units are mentioned here, the term is intended to express the fact that these need not be springs in the narrower sense of the word, i.e. in the form of helical or leaf springs or the like, but that any apparatus which has a spring action can be used here.

In the embodiment shown, the spring units 15 and 16 are formed by adjustable and lockable pneumatic springs, as in a preferred embodiment. It is expedient to use commercially available pneumatic springs in which a spill valve (not shown) can be opened, for example with the aid of a control lever 17, so that, for example, the springs 16 are compressed, with a slight resistance, under the load of the platform 5 and can thus be brought into any desired starting position. In this position, the lever 17 is then released again, with the result that the spill valve closes and the relevant pneumatic spring 16 has adjusted to the new length.

In this way, the starting position of at least one of the spring units, preferably at least the unit with the less steep characteristic, i.e. the spring 15 (as will be explained below), expediently both springs 15, 16, is adjustable and can be fixed by means of the locking apparatus 17. However, it should be emphasized that both spring units 15, 16 always remain connected,

over the entire displacement of the load-supporting apparatus 5, to their bearing on the axle 19 on the stand 1 on the one hand and to their abutment 18 on the load-supporting apparatus 5 on the other hand.

Fig. 3 illustrates the curves for the spring forces. In this figure, the characteristics of the three spring units are shown in terms of the spring force P and the spring displacement L, the overall characteristic S of the spring unit 13 being obtainable from the relevant cumulative curves. Each line corresponding to a spring characteristic has the reference symbol of the associated spring plus 100.

The load-supporting apparatus according to the invention functions as follows. As a first precondition, it is assumed that the spring unit 13 is designed so that, in the open state, i.e. when the spring displacement is zero, that is to say when the load-supporting apparatus 5 is in the raised position, it supports a load (e.g. a man) of 90 kg. If the man wishes to lower himself, he operates the lever 17 and hence the spill valve of the powerful pneumatic spring 16 with the steep characteristic 116, with the result that the characteristic shifts to the line 116', until he has reached the desired height by means of the spring displacement L1, whereupon he releases the lever 17 again. Consequently, the characteristic of the powerful pneumatic spring shifts to position 116". The pneumatic spring is now locked at the new height for the same weight, or the same force of 90 kg. However, the weaker pneumatic spring 15 with the flatter characteristic now acts in such a way that the resilience range is increased in comparison with the starting position because the pneumatic spring 15 presses upward and the pneumatic spring 16 locked at the new height tries to pull upward, the weight of the man acting against both

springs. If it is intended to raise the load-supporting apparatus 5 again, the man reduces the force acting on the load-supporting apparatus 5 only slightly by pulling with one hand on the chassis above him or pressing down against the stand 1, or by supporting himself on the floor with his legs. If he simultaneously operates the lever 17 with the other hand, the powerful pneumatic spring 16 with the steep characteristic 116 will then force the load-supporting apparatus 5 upward again. In this position, he releases the lever 17, and his entire weight will be supported again in the upper position (characteristic 116).

If it is then intended that the load-supporting apparatus be used by a smaller load, for example a man weighing only 70 kg, at the stated setting the load-supporting apparatus 5 would not fall under the smaller weight, despite operation of the lever 17. To adjust the spring unit 13 in this case, the man increases the force acting on the platform 5 only slightly by pulling downward with one hand on the stand 1 or pushing upward against the chassis above him while operating the lever 17 with the other hand; this lowers the load-supporting apparatus 5 to a somewhat lower level, for example likewise through the spring displacement L1, whereupon he releases the lever 17 again and thus provisionally locks the set height. By means of a similar lever 17', he then operates the spill valve of the weaker pneumatic spring 15 with the flatter characteristic 115. The characteristic then shifts to the line 115' and adjusts the spring unit 13 to the lower load/force corresponding to the relevant height. The overall characteristic S2 results. The platform 5 can now be raised again by reducing the load slightly and operating the lever 17, as described above, and the pneumatic spring 15 must be pulled by the other pneumatic spring 16 beyond the

height previously set; this spring loses some of its force to the spring 15, with the result that the spring unit 13 is now adjusted to a lower load.

It must be stated that, in Fig. 3, the curves for the spring characteristics are merely theoretical and illustrated schematically, and may differ in relation to one another. Furthermore, the force available for the displacement is of course smaller than the spring force shown in the graph owing to the geometry of the connecting rods, this deviation being greater or lesser depending on the height set.

In a practical embodiment, the total possible spring displacement of the pneumatic springs 15 and 16 may be about 150 mm, the initial force of the spring 16 may be 75 kg, its final force (when the spill valve is open) may be about 100 kg, the initial force of the spring 15 may be approximately 25 kg and its final force (when the spill valve is closed) may be, for example, 450 kg.

The final force (for the lower end of the displacement of platform 5) is further increased by the characteristic 114 of the spring 14 in a non-linear manner to give the overall characteristic S3. In fact, this spring 14 has only a small spring displacement L2 and is furthermore very steep, so that, for the displacement from the lower to the upper position, it gives rise to initial forces which may reach almost 1 ton, for example 900 kg. Although the lifting apparatus shown in Fig. 1 and 2 is intended only for the weight of a man, the spring forces required to compensate the non-linear load, which is based on a trigonometric function and is due to the connecting rod geometry of the coupled spring unit 13, and to compensate the upward-acting force component, which is initially very small, must be relatively large. Of course, the overall

characteristic shown in Fig. 3 cannot constitute an exact compensation of the load characteristic but will be sufficient for the normal case. If an arrangement is desired in which the load characteristic is completely compensated, i.e. the spring forces act uniformly upward at (at least almost) every point along the spring displacement, the trigonometric function of the load characteristic can be smoothed by arranging further springs which are similar to spring 14 and have a shorter spring displacement, so that, instead of the bend in the curves 115, 114, a plurality of such bends are obtained as a result of a gradation of spring displacements of various lengths.

In the case of the pneumatic springs 15, 16, adjustment can be effected by means of the locking apparatus itself, since this apparatus can be used to set the initial position from which the pneumatic spring is effective. However, it is also possible to provide a separate adjusting means, this being done particularly where other spring units are used. Thus, the upper spring bearing 18 may be mounted so that it can be displaced in the longitudinal direction of the platform 5, the said bearing being capable of being fixed in different positions. Adjustment of the height of the upper and/or lower spring bearing is also possible.

It is preferable if the rubber elements 14 are arranged on the piston of the more powerful pneumatic spring 16 with the steeper characteristic, because in this case the joints by means of which the two pneumatic springs 15, 16 are attached to the stand 1 are subjected to loads which differ to a smaller extent. The advantage of this arrangement will become clear straight away if, when comparing the two extreme positions shown in Fig. 1, it is borne in mind that, in the lower

position, the cylinder of the pneumatic spring 16' comes into contact with and compresses the spring 14 (in contrast to Fig. 2). When, under the action of a force, the platform 5 is lowered to such an extent that the spring 14 is compressed by the cylinder of the pneumatic spring 16', the pressure spring 14 is subjected to stress and stores power, which it gives up again at the beginning of the lifting movement when the locking apparatus is released by operating the lever 17. Because of the geometry of the coupling of the pneumatic springs 15, 16 to the stand 1 and to the platform 5, only a small force component will act upward at the beginning of the displacement, whereas the larger force component acts parallel to the plane of the platform 5 and is thus useless. It is therefore advantageous if, to compensate this non-linear load characteristic, the spring 14 additionally acts in the region in which the load is greatest for the spring unit 13. Further compensation is obtained by combining the two pneumatic springs 15, 16 of different characteristics. In a simplified embodiment comprising a total of only two spring units, the compensation is less successful. On the other hand, in order to achieve better compensation of the non-linear load characteristic, it may be desirable in special cases to provide additional spring elements. Thus, the design may be such that each of the two parts of the spring 14 in turn has a different characteristic. If necessary, a third spring may furthermore extend parallel to the pneumatic springs 15, 16 or in another direction.

A large number of modifications are possible within the scope of the invention; for example, although arranging the spring 14 on the piston rod of a pneumatic spring is simple from a constructional point of view and advantageous, it is also possible to adopt a

different arrangement, for example one in which, at the lower end of the downward movement of the platform 5, a spring of this type having a short displacement comes into contact with platform 5 itself or with another part connected to platform 5. While this is the simplest method of bringing the spring 14 into effect in the correct phase of movement, there are also other possibilities, for example subjecting a spring corresponding to spring 14 to tension by means of another spring during the upward movement and then releasing it at the correct time for contact. However, this requires a corresponding outlay for gears and would probably be appropriate to employ if it is intended to use a geometric arrangement as disclosed in German Patent 2,941,454. Hence, the coupling illustrated, of the springs 15, 16, in particular together with the spring 14, is preferred since it manages without complicated gears. In the case of double scissors, it would also be possible, as already mentioned, for at least one spring unit to be stretched between the outer ends of the connecting rods, in which case a tension spring would be used instead of the pressure springs described here.

PATENT CLAIMS

1. Load-supporting apparatus which is connected to a stand arranged on the floor by means of scissor-like connecting rods, of which at least two connecting rods are each coupled to an axle borne by the stand, and whose height can be adjusted via at least two spring units which have different characteristics and each of which has a starting position in which it is completely relaxed, a bearing being assigned to one end of each spring unit and an abutment to the other end, wherein the two spring units (15, 16) are each connected to a bearing and an abutment over the entire lifting height of the load-supporting apparatus (5), and the locking apparatus (17) is in the form of an adjusting means which permits the starting position of at least one spring unit (15 or 16) to be fixed at different lifting heights of the load-supporting apparatus (5).

2. Load-supporting apparatus as claimed in claim 1, wherein at least the spring unit (15) with the less steep characteristic (115) and lower initial spring force has a starting position which can be fixed at various lifting heights and is therefore adjustable in respect of the force exerted on the load-supporting apparatus (5) in the direction of lifting.

3. Load-supporting apparatus as claimed in claim 2, wherein a locking apparatus (17) is assigned to each spring unit (15, 16), and the starting positions of the two spring units (15, 16) can be assigned to different lifting heights of the load-supporting apparatus (5).

4. Load-supporting apparatus as claimed in claim

1, 2 or 3, wherein at least one of the spring units (15, 16) having a different characteristic is in the form of a pneumatic spring with a cylinder, a piston and a piston rod.

5. Load-supporting apparatus as claimed in one of the preceding claims, wherein the two spring units (15, 16), which are preferably formed from pneumatic springs, connect the stand (1) directly to the load-supporting apparatus (5).

6. Load-supporting apparatus as claimed in one of the preceding claims, wherein at least one spring unit (15, 16) has its bearing on one of the axles of the connecting rods (7, 8), in particular on an axle connected to the stand (1).

7. Load-supporting apparatus as claimed in one of the preceding claims, wherein the stand (1) has a central U-shaped depression into which the spring units (14 - 16) can be lowered when the load-supporting apparatus (5) is in the collapsed state, and, preferably, rollers (2) are provided underneath the upward-pointing U limbs of the stand (1).

8. Load-supporting apparatus as claimed in one of the preceding claims, wherein at least one third pressure spring (14) which presses against its abutment in an end part of the movement of the load-supporting apparatus (5), in particular in the lower part, is provided, and this pressure spring (14) is preferably arranged on the piston rod of a pneumatic spring (15, 16) whose cylinder forms the abutment, this pressure spring (14) expediently being arranged on the piston rod of the spring unit (16) with the steeper characteristic

(116).

9. Load-supporting apparatus as claimed in claim 8, wherein the pressure spring (14) has a steep characteristic (114) and a short spring displacement and is preferably in the form of a rubber element.

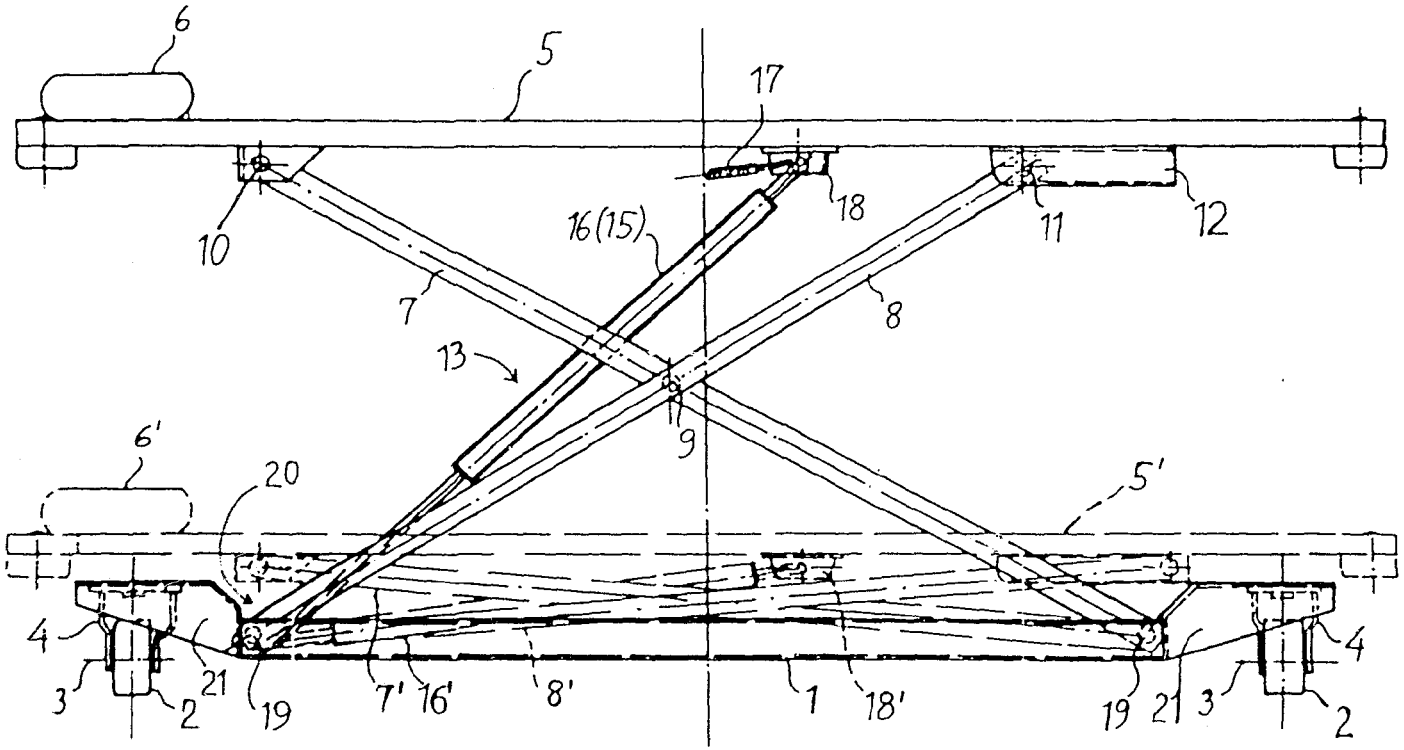


Fig. 1

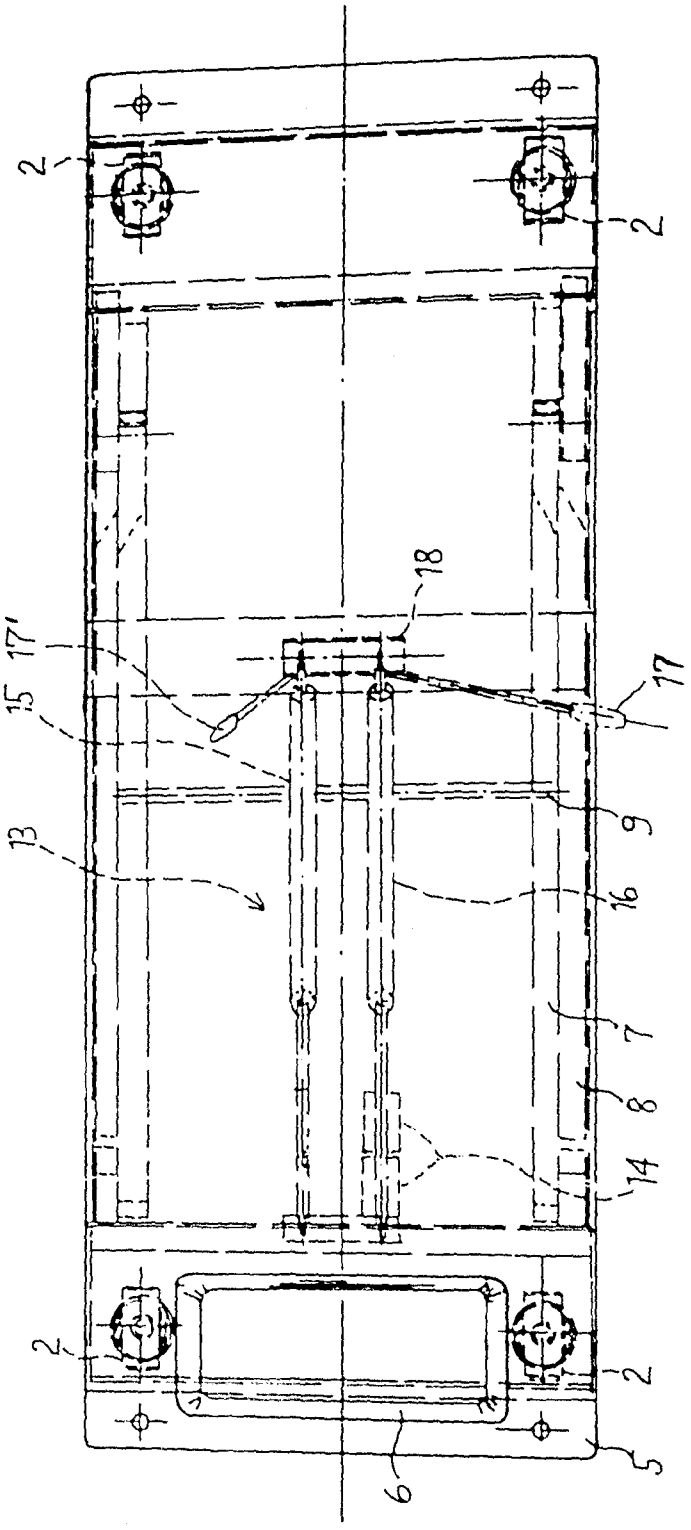


Fig. 2

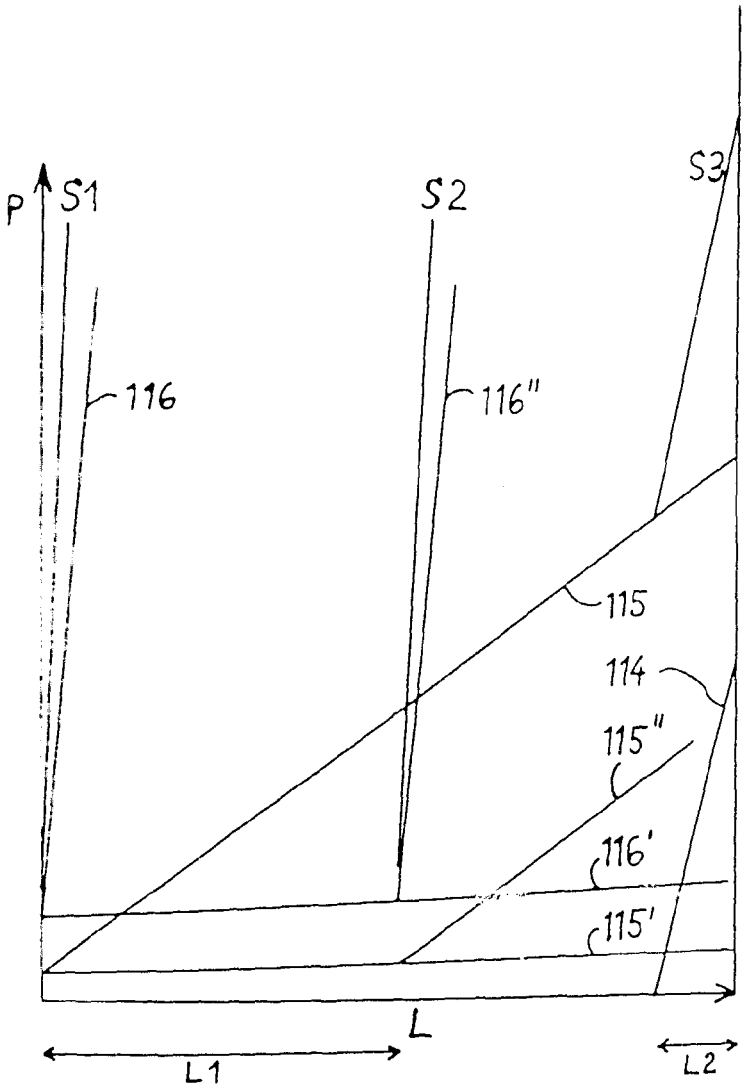


Fig. 3

INTERNATIONAL SEARCH REPORT

International Application No PCT/CH 86/00050

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [6]

According to International Patent Classification (IPC) or to both National Classification and IPC

Int. Cl.4 : B 66 F 7/06; B 25 H 5/00

II. FIELDS SEARCHED

Minimum Documentation Searched [7]

Classification System [8]	Classification Symbols
Int. Cl.4	B 66 F; B 25 H; A 61 G; A 47 B; A 47 C

Documentation Searched other than Minimum Documentation to the Extent that such Documents are included in the Fields Searched [9]

III. DOCUMENTS CONSIDERED TO BE RELEVANT [9]

Category [10]	Citation of Document, [11] with indication, where appropriate, of the relevant passages [12]	Relevant to Claim No. [13]
A	US, A, 3096059 (JOHNSON) July 2, 1963, see column 5, lines 35-75; column 6; column 7, lines 1-16; column 9, lines 54-75; column 10, lines 1-6	1
A	DE, C1, 3138717 (LADENBAU JAKOB MAIER) June 1, 1983	
A	US, A, 3116910 (MOORE) January 7, 1964	
A	GB, A, 551813 (CHESTON) March 10, 1943	
A	FR, A, 2167190 (BREMSHEY) August 17, 1973	
A	DE, A, 1920696 (FICHTEL & SACHS) November 12, 1970	
A	FR A, 2058802 (VAN DER MEIJ) May 28, 1971	

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* Special categories of cited documents: [10]

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
10 July 1986 (10.07.86)	31 July 1986 (31.07.86)
International Searching Authority	**Signature of Authorized Officer**
European Patent Office	

Form PCT/ISA/210 (second sheet) (January 1985)

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)

Category *	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No
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A	CH, A, 473731 (BINZ & CO.) July 31, 1969	
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ANNEX TO THE INTERNATIONAL SEARCH REPORT ON

INTERNATIONAL APPLICATION NO. PCT/CH 86/00050 (SA 12849)

This Annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 17/07/86

The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A- 3096059		None	
DE-C- 3138717	01/06/83	None	
US-A- 3116910		None	
GB-A- 551813		None	
FR-A- 2167190	17/08/73	NL-A- 7217712	03/07/73
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		CH-A- 547634	11/04/74
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FR-A- 2058802	28/05/71	None	
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CH-A- 473731	15/06/69	NL-A- 6807167	02/12/68
		FR-A- 1567567	16/05/69
		BE-A- 715329	16/10/68
US-A- 1327103		None	
FR-A- 2282575	19/03/76	None	

For more details about this annex :
see Official Journal of the European Patent Office, No. 12/82

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(74) 대리인
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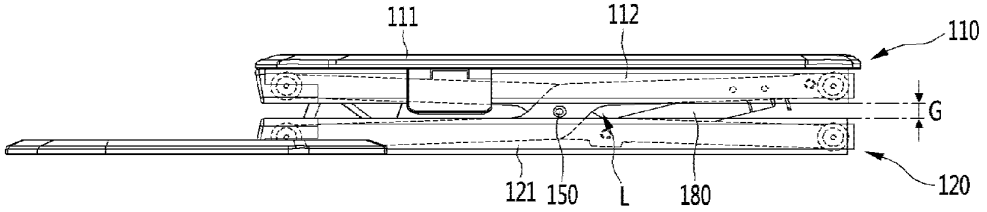
전체 청구항 수 : 총 8 항 심사관 : 이성희

(54) 발명의 명칭 **높낮이 조절 가능한 책상**

(57) 요 약

본 발명은 베이스와; 상판과; 상기 베이스와 상판 사이에 배치되어 상기 상판을 승강 가능하게 지지하는 링크 기구를 포함하고, 상기 링크 기구는 양단이 각각 상기 베이스와 상판과 힌지를 통해 연결되는 제1 연결부재 및 일단부는 상기 베이스 및 상판 중 어느 하나와 힌지 결합되고, 타 단부는 상기 베이스 및 상판 중 다른 하나에 대해 이동 가능하게 결합되는 제2 연결부재를 각각 포함하고, 상기 제2 연결부재의 슬라이드 거리를 임의의 위치로 제한하는 스토퍼를 추가적으로 포함하는 높낮이 조절 가능한 책상을 제공한다.

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명 세 서

청구범위

청구항 1

베이스와;

상판과;

상기 베이스와 상판 사이에 배치되어 상기 상판을 승강 가능하게 지지하는 링크 기구; 및

상기 베이스에 대해서 상기 상판을 임의의 높이에서 고정시키는 높이조절기구;를 포함하고,

상기 링크 기구는 양단이 각각 상기 베이스와 상판과 힌지를 통해 연결되는 제1 연결부재 및 일 단부는 상기 베이스 및 상판 중 어느 하나와 힌지 결합되고, 타 단부는 상기 베이스 및 상판 중 다른 하나에 대해 슬라이드 가능하게 결합되는 제2 연결부재를 각각 포함하고,

상기 제2 연결부재의 슬라이드 경로상에 배치되어 슬라이드 거리를 임의의 위치로 제한하는 스토퍼를 추가적으로 포함하고,

상기 제2 연결부재는 상기 스토퍼에 의해 정해지는 슬라이드 범위 내에서 슬라이드 가능한 것을 특징으로 하는 높낮이 조절 가능한 책상.

청구항 2

삭제

청구항 3

제 1 항에 있어서,

상기 베이스 및 상기 상판 중 어느 하나에는 상기 스토퍼가 고정되는 복수 개의 슬릿이 형성되는 높낮이 조절 가능한 책상.

청구항 4

제 3 항에 있어서,

상기 슬릿은 상기 제2 연결부재의 슬라이드 경로 상에 복수 개가 배치되는 높낮이 조절 가능한 책상.

청구항 5

삭제

청구항 6

제 3 항에 있어서,

상기 스토퍼는

상기 제2 연결부재와 접촉하여 제2 연결부재의 이동을 구속하는 접촉부재; 및

상기 접촉부재와 연결되는 손잡이부재;를 포함하는 높낮이 조절 가능한 책상.

청구항 7

제6항에 있어서,

상기 스토퍼는 상기 접촉부재와 상기 손잡이부재를 연결하는 연결부재를 더 포함하는 높낮이 조절 가능한 책상.

청구항 8

제 7 항에 있어서,

상기 연결부재는 상기 슬릿에 관통되도록 삽입되는 높낮이 조절 가능한 책상.

청구항 9

제 1 항에 있어서,

상기 제1 및 제2 연결부재는 서로 교차하도록 힌지 결합되는 높낮이 조절 가능한 책상.

청구항 10

제 1 항에 있어서,

상기 제1 및 제2 연결부재는 서로 평행하도록 배치되는 높낮이 조절 가능한 책상.

발명의 설명

기 술 분 야

[0001] 본 발명은 높낮이 조절 가능한 책상에 관한 것이다.

배 경 기 술

[0002] 회사나 학교 등에는 사람이 앉을 수 있는 의자와 함께, 컴퓨터와 책을 놓고 업무 또는 교육을 수행하기에 편리하도록 책상이 구비되어 있다. 이와 같은 기존의 책상들은 높이가 획일적으로 일정하게 만들어지므로 높낮이를 조절할 수 있는 별도의 기능이 없었다.

[0003] 상기의 공간에서 근무를 하거나 수업을 받는 사람들은 대부분의 시간을 앉아서 생활하므로 척추가 휘어지는 척추 측만증이 발생하거나, 책상에 놓여진 책과 눈과의 거리 초점이 맞지 않아 눈이 쉽게 피로해지는 등의 정신적 육체적 스트레스가 쌓인다. 이로 인해, 건강한 정신과 육체의 성장에 좋지 못한 영향이 초래되므로 효율적인 업무를 수행하기 어려운 문제점이 있다.

[0004] 최근에는 이를 고려하여, 컴퓨터와 책이 받쳐지는 상판의 저면에 길이가 상대적으로 긴 지지대를 결합하여, 서있는 상태에서 사용할 수 있는 책상이 보급되고 있다. 그러나, 일을 하기 위해 장 시간 서있는 것은 더욱 피곤하므로 이러한 책상으로 전술한 문제점을 해결하기에는 한계가 있다.

[0005] 장시간 앉아있는 것으로부터 규칙적으로 스트레칭, 운동 등의 휴식을 취하는 것은 신체 또는 정신에 긍정적인 결과를 가져올 수 있으나, 과중한 업무를 수행하는 현대인의 상황을 고려할 때 제약이 많다. 따라서, 계속적인 업무가 수행될 수 있으면서도 사용자의 건강을 고려할 수 있는 인체 공학적인 책상이 요구되고 있다.

[0006] 이러한 요구에 부응하여 최근에는 다양한 형태의 높이 조절 책상이 선보이고 있다. 이러한 높이 조절 책상 중 일부는 모터 등을 이용하여 책상 전체가 상하로 이동하도록 한 형태를 갖고 있으나, 이는 모터와 같은 액츄에이터를 필요로 하므로 제조비용이 상승하고, 구조가 복잡한 문제가 있다.

[0007] 높이 조절 책상의 다른 예로서, 스프링 등의 탄성부재와 이에 연결되는 링크 부재를 포함하여, 사용자가 수동으로 책상의 높이를 조절할 수 있도록 한 형태의 것들도 소개된 바 있다. 상기와 같은 수동 조작식 높이 조절 책상의 경우 구조가 간단하고 제조 비용이 낮은 이점이 있다.

[0008] 그러나, 이러한 기계식 링크 부재를 이용하는 높이 조절 책상의 경우 최대 높이가 제조시에 결정된 높이로 고정되기 때문에 다양한 신체조건에 맞도록 적절한 높이를 제공하지 못하는 문제점이 있었다.

발명의 내용

해결하려는 과제

[0009] 본 발명은 상기와 같은 문제점을 개선하기 위하여 제안된 것으로서, 사용자가 상판을 간편하게 승강시킬 수 있으면서도, 사용자의 신체 조건에 따라 최대 높이를 임의로 설정할 수 있는 높낮이 조절 가능한 책상을 제공하는 것을 목적으로 한다.

과제의 해결 수단

[0010] 상기와 같은 기술적 과제를 달성하기 위한 본 발명의 일 측면에 의하면, 베이스와; 상판과; 상기 베이스와 상판 사이에 배치되어 상기 상판을 승강 가능하게 지지하는 링크 기구를 포함하고, 상기 링크 기구는 양단이 각각 상기 베이스와 상판과 힌지를 통해 연결되는 제1 연결부재 및 일 단부는 상기 베이스 및 상판 중 어느 하나와 힌지 결합되고, 타 단부는 상기 베이스 및 상판 중 다른 하나에 대해 이동 가능하게 결합되는 제2 연결부재를 각각 포함하고, 상기 제2 연결부재의 슬라이드 거리를 임의의 위치로 제한하는 스토퍼를 추가적으로 포함하는 높낮이 조절 가능한 책상이 제공된다.

[0011] 여기서, 상기 스토퍼는 상기 제2 연결부재의 슬라이드 경로상에 배치될 수 있다.

[0012] 또한, 상기 베이스 및 상기 상판 중 어느 하나에는 상기 스토퍼가 고정되는 복수 개의 슬릿이 형성될 수 있다.

[0013] 또한, 상기 상기 슬릿은 상기 제2 연결부재의 슬라이드 경로 상에 복수 개가 배치될 수 있다.

[0014] 또한, 상기 변형부는 상기 링크의 양단부 사이에 위치하는 절곡부를 포함할 수 있다.

[0015] 또한, 상기 스토퍼는 상기 제2 연결부재와 접촉하여 제2 연결부재의 이동을 구속하는 접촉부재; 및 상기 접촉부재와 연결되는 손잡이부재;를 포함할 수 있다.

[0016] 또한, 상기 스토퍼는 상기 접촉부재와 상기 손잡이부재를 연결하는 연결부재를 더 포함할 수 있다.

[0017] 또한, 상기 상기 연결부재는 상기 슬릿에 관통되도록 삽입될 수 있다.

[0018] 또한, 상기 제1 및 제2 연결부재는 서로 교차하도록 힌지 결합될 수 있다.

[0019] 또한, 상기 제1 및 제2 연결부재는 서로 평행하도록 배치될 수 있다.

발명의 효과

[0020] 상기와 같은 구성을 갖는 본 발명의 일측면에 의하면, 스토퍼가 상판의 최대 상승 높이나 상판의 최대 하강 높이를 결정할 수 있어, 사용자의 신체에 맞도록 최대 및 최소 높이를 임의로 설정할 수 있어 사용 편의성이 향상되는 이점이 있다.

도면의 간단한 설명

[0021] 도 1은 본 발명의 제 1 실시예에 따른 높낮이 조절 가능한 책상이 도시된 사시도.

도 2는 상판과 베이스를 분리한 높낮이 조절 가능한 책상이 도시된 사시도.

도 3은 도 1의 A를 확대한 사시도.

도 4는 본 발명의 제 1 실시예에 따른 높이조절기구를 설명하기 위한 측면도.

도 5는 본 발명의 제 1 실시예에 따른 상판이 하부로 이동된 모습을 보인 사시도.

도 6은 본 발명의 제 1 실시예에 따른 높낮이 조절 가능한 책상에 고정다리를 결합한 모습을 보인 사시도.

도 7은 본 발명의 제 1 실시예에 따른 높낮이 조절 가능한 책상과 고정다리의의 분해 사시도.

도 8은 본 발명의 제 2 실시예에 따른 높낮이 조절 가능한 책상의 사시도.

도 9는 본 발명의 제 2 실시예에 따른 보조 받침대를 분리한 모습을 보인 사시도.

도 10은 본 발명의 제 3 실시예에 따른 높낮이 조절 가능한 책상의 사시도.

도 11은 본 발명의 제 3 실시예에 따른 높이조절기구의 결합구조를 설명하기 위한 확대도.

도 12는 본 발명의 제 3 실시예에 따른 상판이 하부로 이동된 모습을 보인 사시도.

도 13은 본 발명의 제 4 실시예에 따른 높낮이 조절 가능한 책상의 사시도.

도 14는 본 발명의 제 4 실시예에 따른 상판과 베이스를 분리한 높낮이 조절 가능한 책상이 도시된 사시도.

도 15는 본 발명의 제 4 실시예에 따른 상판이 하부로 이동된 모습을 보인 사시도,

도 16은 본 발명의 제 5 실시예에 따른 높낮이 조절 가능한 책상이 도시된 사시도,

도 17는 본 발명의 제 5 실시예의 상판이 상승되었을 때의 측면도,

도 18는 본 발명의 제 5 실시예의 상판이 최저 높이로 하강되었을 때의 측면도,

도 19은 본 발명의 제 6 실시예의 상판이 스토퍼에 의해 상승 제한될 때의 단면도,

도 20은 본 발명의 제 6 실시예의 상판이 스토퍼에 의해 하강 제한될 때의 단면도.

도 21은 본 발명의 제 7 실시예에 따른 높낮이 조절 가능한 책상의 후방측 사시도,

도 22은 본 발명의 제 7 실시예의 수평 유지부가 확대 도시된 사시도,

도 23은 본 발명의 제 8 실시예의 높낮이 조절 가능한 책상이 도시된 사시도,

도 24은 본 발명의 제 9 실시예의 높낮이 조절 가능한 책상이 도시된 사시도,

도 25은 본 발명의 제 10 실시예의 높낮이 조절 가능한 책상이 도시된 사시도,

도 26은 본 발명의 제 11 실시예의 높낮이 조절 가능한 책상이 도시된 사시도,

도 27은 본 발명의 제 12 실시예의 높낮이 조절 가능한 책상의 상판이 상승되었을 때의 사시도,

도 28은 본 발명의 제 12 실시예의 높낮이 조절 가능한 책상의 상판이 하강되었을 때의 사시도,

도 29는 본 발명의 제 13 실시예의 높낮이 조절 가능한 책상이 도시된 사시도,

도 30은 본 발명의 제 13 실시예의 높낮이 조절 가능한 책상이 도시된 측면도,

도 31은 상기 제13 실시예의 변형예를 도시한 사시도이다.

발명을 실시하기 위한 구체적인 내용

[0022] 이하에서는 본 발명의 구체적인 실시예를 도면과 함께 상세히 설명하도록 한다.

[0023] 이하, 첨부된 도면을 참조하여 본 명세서에 개시된 실시예를 상세히 설명하되, 도면 부호에 관계없이 동일하거나 유사한 구성요소는 동일한 참조 번호를 부여하고 이에 대한 중복되는 설명은 생략하기로 한다. 이하의 설명에서 사용되는 구성요소에 대한 접미사 "부"는 명세서 작성의 용이함만이 고려되어 부여되거나 혼용되는 것으로서, 그 자체로 서로 구별되는 의미 또는 역할을 갖는 것은 아니다. 또한, 본 명세서에 개시된 실시예를 설명함에 있어서 관련된 공지 기술에 대한 구체적인 설명이 본 명세서에 개시된 실시예의 요지를 흐릴 수 있다고 판단되는 경우 그 상세한 설명을 생략한다. 또한, 첨부된 도면은 본 명세서에 개시된 실시예를 쉽게 이해할 수 있도록 하기 위한 것일 뿐, 첨부된 도면에 의해 본 명세서에 개시된 기술적 사상이 제한되지 않으며, 본 발명의 사상 및 기술 범위에 포함되는 모든 변경, 균등물 내지 대체물을 포함하는 것으로 이해되어야 한다.

[0025] 도 1은 본 발명의 제 1 실시예에 따른 높낮이 조절 가능한 책상이 도시된 사시도 이고, 도 2는 상판과 베이스를 분리한 높낮이 조절 가능한 책상이 도시된 사시도 이며, 도 3은 도 1의 A를 확대한 사시도 이다.

[0026] 도 1 내지 도 3을 참조하면 본 발명의 제 1 실시예에 따른 높낮이 조절 가능한 책상(100)은 베이스(120)와, 상판(110)를 포함할 수 있다.

[0027] 베이스(120)는 높낮이 조절 가능한 책상(100)의 하부를 형성할 수 있고, 하면이 지면 또는 바닥면에 접촉되어 높낮이 조절 가능한 책상(100)을 지지할 수 있다. 베이스(120)의 전방에는 후방을 향해 소정거리 함몰되는 함몰홈(122)이 형성될 수 있다. 함몰홈(122)은 사용자의 신체 중 일부를 수용할 수 있고, 사용자는 높낮이 조절 가능한 책상(100)의 전방에 위치할 경우 높낮이 조절 가능한 책상(100)에 보다 가까이 다가갈 수 있다.

[0028] 상판(110)은 대략 판 형상으로 형성된다. 경우에 따라서, 상판(110)은 함몰홈(122)을 포함한 베이스(120)의 단면 형상과 대응되도록 형성될 수 있다. 상판(110)의 상면에는 사용자의 업무 또는 학습 도구들이 놓일 수 있다. 예를 들면, 상판(110)의 상면에는 모니터, 책, 키보드 등 다양한 도구들이 놓일 수 있다.

[0029] 그리고, 상판(110)의 후방부에는 전방을 향해 함몰되는 배선 수용홈(187)이 형성될 수 있다. 배선 수용홈(187)은 상판(110)의 후방부 일부가 내측으로 함몰되어 상판(110)에 구비될 수 있다. 배선 수용홈(187)에는 상판(110)에 놓여지는 업무 도구 중 일부가 수용될 수 있다. 예를 들면, 상판(110)에 컴퓨터 모니터가 놓여질 경우,

컴퓨터 모니터로 전력을 제공하는 배선이 배선 수용홈(187)에 수용됨으로써 보다 깔끔하게 정돈될 수 있다.

[0030] 높이 조절 가능한 책상은 상판(110)과 베이스(120)를 연결하며, 베이스(120)에 대한 상판(110)의 높이를 조절하기 위한 높이조절수단을 포함할 수 있다.

[0031] 높이조절수단은 상판(110)의 아래에 위치되게 구비될 수 있다. 높이조절수단은 베이스(120)와 상판(110)의 사이에 배치될 수 있다.

[0032] 높이조절수단은 베이스(120)와 상판(110) 사이에 배치되어 상판(110)을 승강 가능하게 지지하는 링크 기구를 포함할 수 있다. 높이조절수단은 사용자의 조작시 상판(110)을 상승시키는 방향으로 가압하는 구동원을 포함할 수 있다.

[0033] 높이조절수단은 상판(110)을 베이스(120)에 대하여 상대 이동시키기 위한 복수의 연결부재(130,140)를 포함할 수 있다. 복수의 연결부재(130,140)는 상판(110)과 베이스(120)와 거리가 변화되게 상판(110)을 승강시킬 수 있다.

[0034] 복수의 연결부재(130,140)는 상판(110)과 베이스(120)의 사이에서 양 측에 각각 구비될 수 있다. 복수의 연결부재(130, 140)는 상판(110)의 후방 측 저면으로부터 베이스(120)의 전방 측 상면을 향해 연장되는 제 1 연결부재(130)와, 상판(110)의 전방 측 저면으로부터 베이스(120)의 후방 측 상면을 향해 연장되는 제 2 연결부재(140)를 포함한다. 제 1 연결부재(130)와 제 2 연결부재(140)는 상판(110)과 베이스(120)의 사이에서 서로 교차되게 배치될 수 있다. 제 1 연결부재(130)와 제 2 연결부재(140)는 옆에서 볼 때, 대략 'X'자 형태를 이루게 배치될 수 있다.

[0035] 제 1 연결부재(130)는 일단이 베이스(120)의 전방 측 상면에 구비되는 제 1 결합부(160)와 결합되고, 타단이 상판(110)의 후방 측 저면에 구비되는 제 1 이동프레임(165)에 슬라이딩 이동되는 제 1 이동부(169)와 결합된다. 제 1 결합부(160)와 제 1 이동프레임(165)은 제 1 연결부재(130)의 개수에 대응하여 베이스(120)의 상면 양측과 상판(110)의 저면 양측에 각각 구비된다.

[0036] 제 1 결합부(160)는, 하면이 베이스(120)의 상면에 나사 또는 링크를 통해 결합되는 제 1 수평부(164)와, 제 1 수평부(164)의 일측으로부터 상방을 향해 연장되어 제 1 연결부재(130)의 일단이 결합되는 제 1 수직부(162)를 포함한다. 그리고, 제 1 수직부(162)의 측면에 제 1 연결부재(130)의 일단이 회동 가능하도록 힌지 결합된다. 즉, 제 1 연결부재(130)로부터 제 1 수직부(162)를 관통하는 힌지핀(131)에 의해 제 1 연결부재(130)의 일단이 회동 가능하도록 결합된다.

[0037] 제 1 이동프레임(165)은 상판(110)의 후방 측 하면 양측에 각각 구비된다. 제 1 이동프레임(165)은, 상면이 상판(110)의 하면에 결합되는 제 1 상면부(166)와, 제 1 상면부(166)의 일측에서 하방을 향해 연장되는 제 1 측면부(167)와, 제 1 측면부(167)의 단부로부터 내측을 향해 연장되는 제 1 하면부(168)를 포함한다. 제 1 상면부(166)와 제 1 측면부(167) 와 상기 제 1 하면부(168)에 의해 제 1 이동프레임(165)의 단면 형상은 대략 ㄷ 자 형상을 이룬다. 그리고, 제 1 이동프레임(165)의 제 1 상면부(166)와 제 1 측면부(167)와 제 1 하면부(168)에 의해 형성되는 공간에는 제 1 이동부(169)의 외면이 접하며 슬라이딩 이동될 수 있다.

[0038] 제 1 이동부(169)의 측면에는 제 1 연결부재(130)의 타단이 힌지 결합되어, 제 1 이동부(169)가 제 1 이동프레임(165)을 슬라이딩 이동할 경우 제 1 연결부재(130)의 기울기가 변경된다. 다시 말하면, 제 1 연결부재(130)는 제 1 수직부(162)와의 힌지 결합과 제 1 이동부(169)와의 힌지 결합을 통해, 상판(110) 및 베이스(120)와 이루는 각도가 변경된다. 도 2 에 도시된 바와 같이, 제 1 연결부재(130)가 베이스(120)와 이루는 각도가 상대적으로 높을 경우에는 제 1 이동부(169)가 제 1 이동프레임(165)의 전방에 가깝게 위치하고, 제 1 연결부재(130)가 베이스(120)와 이루는 각도가 상대적으로 낮을 경우에는 제 1 이동부(169)가 제 1 이동프레임(165)의 후방에 가깝게 위치한다. 제 1 연결부재(130)의 타단이 슬라이딩 이동됨과 동시에 제 1 연결부재(130)의 일단은 제 1 결합부(160)를 통해 회동될 수 있다.

[0039] 제 2 연결부재(140)는 일단이 상판(110)의 전방 측 하면에 구비되는 제 2 결합부(145)와 결합되고, 타단이 베이스(120)의 후방 측 상면에 구비되는 제 2 이동프레임(170)에 슬라이딩 이동되는 제 2 이동부(144)에 결합된다. 제 2 결합부(145)와 제 2 이동프레임(170)은 제 2 연결부재(140)의 개수에 대응하여 베이스(120)의 상면 양측과 상판(110)의 저면 양측에 각각 구비된다.

[0040] 제 2 결합부(145)는, 상면이 상판(110)의 하면에 나사 또는 링크를 통해 결합되는 제 2 수평부(146)와, 제 2 수평부(146)의 일측으로부터 하방을 향해 연장되어 제 2 연결부재(130)의 일단이 결합되는 제 2 수직부(147)를 포

함한다. 그리고, 제 2 수직부(147)의 측면에 제 2 연결부재(140)의 일단이 회동 가능하도록 힌지 결합될 수 있다. 즉, 제 2 연결부재(140)로부터 제 2 수직부(147)를 관통하는 힌지핀에 의해 제 2 연결부재(140)의 일단이 회동 가능하도록 결합될 수 있다.

[0041] 제 2 이동프레임(170)은 베이스(120)의 후방 측 상면 양측에 각각 구비된다. 제 2 이동프레임(170)은 하면이 베이스(110)의 상면에 결합되는 제 2 하면부(172)와, 제 2 하면부(172)의 일측에서 상방을 향해 연장되는 제 2 측면부(174)와, 제 2 측면부(174)의 단부로부터 외측을 향해 연장되는 제 2 상면부(176)를 포함한다. 제 2 하면부(172)와 제 2 측면부(174)와 제 2 상면부(176)에 의해 제 2 이동프레임(165)의 단면 형상은 대략 ㄷ 자 형상을 이룬다. 그리고, 제 2 이동프레임(170)에는, 상기 제 2 하면부(172)와 상기 제 2 측면부(174)와 상기 제 2 상면부(176)에 의해 형성되는 공간을 슬라이딩 이동 하도록 제 2 이동부(144)가 구비된다.

[0042] 제 2 이동부(144)의 측면에는 제 2 연결부재(140)의 타단이 힌지 결합되어, 제 2 이동부(144)가 제 2 이동프레임(170) 상을 슬라이딩 이동할 경우 제 2 연결부재(140)의 기울기가 변경된다. 다시 말하면, 제 2 연결부재(140)는 제 2 수직부(147)와의 힌지 결합과 제 2 이동부(144)와의 힌지 결합을 통해, 상판(110) 및 베이스(120)와 이루는 각도가 변경된다. 도 2 에 도시된 바와 같이, 제 2 연결부재(140)가 베이스(120)와 이루는 각도가 상대적으로 높을 경우에는 제 2 이동부(144)가 제 2 이동프레임(170)의 전방에 가깝게 위치하고, 제 2 연결부재(130)가 상기 베이스(120)와 이루는 각도가 상대적으로 낮을 경우에는 제 2 이동부(144)가 제 2 이동프레임(170)의 후방에 가깝게 위치한다. 제 2 연결부재(140)의 타단이 슬라이딩 이동됨과 동시에 제 2 연결부재의 일단은 제 2 결합부(145)를 통해 회동될 수 있다.

[0043] 정리하면, 제 1 결합부(160)와 제 2 결합부(145)는 상판(110)의 하면과 베이스(120)의 상면에서 상호 대칭되도록 구비될 수 있고, 제 1 이동프레임(165)과 제 2 이동프레임(170)은 상판(110)의 하면과 베이스(120)의 상면에서 상호 대칭되도록 구비될 수 있다.

[0044] 한편, 제 1 연결부재(130)와 제 2 연결부재(140)가 상호 교차하는 영역에는 회전 중심을 형상하는 회동축(150)이 끼워진다. 상세히, 회동축(150)의 양단부는 양측에 배치되는 복수의 연결부재(130, 140)이 서로 교차하는 영역에 각각 끼워질 수 있다. 이를 위하여, 제 1 연결부재(130)와 제 2 연결부재(140)가 교차하는 영역에는 회동축(150)이 끼워지도록 각각 상호 대응되는 관통홀(미도시)이 형성되고, 관통홀에 회동축(150)의 양단부가 끼워져 고정된다. 따라서, 회동축(150)을 통해 제 1 연결부재(130)와 제 2 연결부재(140)는 상대 회동될 수 있다. 다시 말하면, 회동축(150)은 제 1 연결부재(130)와 제 2 연결부재(140)에 의해 형성되는 'X'자 형상의 중심축을 형성할 수 있다.

[0045] 그리고, 높낮이 조절 가능한 책상(100)의 양측에 각각 복수로 배치되는 제 1 연결부재(130)에는 복수의 제 1 연결부재(130)가 평행하게 동작될 수 있도록 복수개의 제 1 연결부재(130)를 연결하는 연결부재 커넥터(미도시)가 구비될 수 있다. 본 실시예는 복수개의 제 1 연결부재(130)의 내측면에 연결된 결합축(155)이 연결부재 커넥터로 기능할 수 있다.

[0046] 또한, 높낮이 조절 가능한 책상(100)의 양측에 각각 복수로 배치되는 제 2 연결부재(140)에는 복수의 제 2 연결부재(140)가 평행하게 동작될 수 있도록 복수개의 제 2 연결부재(140)를 연결하는 커넥터(142)가 구비될 수 있다.

[0048] 도 4는 본 발명의 제 1 실시예에 따른 높이조절기구를 설명하기 위한 측면도 이다.

[0049] 도 1 및 도 4를 참조하면, 높낮이 조절 가능한 책상(100)은 상판(110)의 높이가 가변되게 설치된 높이조절기구(180)를 포함할 수 있다. 높이조절기구(180)는 가스 스프링과 유압 슬린더 중 적어도 하나를 포함할 수 있다.

[0050] 복수의 제 1 연결부재(130)는 서로 대향되게 위치될 수 있고, 복수의 제 1 연결부재(120)에는 결합축(155)의 양단부가 끼워진다. 결합축(155)은 후술할 높이조절기구(180)의 단부가 결합되는 구성일 수 있고, 복수로 구비되는 제 1 연결부재(130)의 내측면 사이에 수평하게 배치될 수 있고, 복수의 제 1 연결부재(130)에 끼워져 고정된다.

[0051] 그리고, 상판(110)의 전방 측 하면에는 높이조절기구(180)의 또 다른 단부가 끼워지는 높이조절기구 결합부(115)가 구비된다. 높이조절기구 결합부(115)는 상기 상판(110)의 하면 중 전단에 가깝도록 배치될 수 있다. 상세히, 높이조절기구 결합부(115)는 상판(110)의 하면에 결합되는 결합부 몸체(116)와, 결합부 몸체(116)의 일측으로부터 하방으로 연장되어 높이조절기구(180)의 단부가 통과되도록 축이 구비되는 결합부 연장체(117)를 포함할 수 있다. 높이조절기구 결합부(115)는 각각 중심에 대해 서로 대칭하여 복수로 구비될 수 있다.

[0052] 그리고, 상판(110)의 높낮이를 조절하기 위하여 일단이 높이조절기구 결합부(115)에 끼워지고, 타단이 결합축(155)에 끼워지는 높이조절기구(180)이 구비된다. 도 4에 도시된 바와 같이, 높이조절기구(180)은 중공의 튜브 형상의 실린더(181)와, 실린더(181) 안의 중공 부분에 삽입되는 피스톤 로드(182)를 포함한다. 그리고, 실린더(181)의 하부에 배치되는 결합부(184)에 홀(184a)이 형성되어, 결합축(155)이 홀(184a)을 관통함으로써 높이조절기구(180)의 타단을 고정시킨다. 또한, 피스톤 로드(182)의 상부에는 마찬가지로 결합부 연장체(117)에 구비된 축이 통과하도록 홀(182a)이 형성되며, 결합부 연장체(117)의 축이 홀(182)을 통과함으로써 높이조절기구(180)의 일단을 고정시킨다.

[0053] 한편, 높이조절기구(180)은 피스톤 로드(182)가 실린더(181)에 대하여 상하 동작됨으로써 길이가 가변될 수 있는 구성이다. 즉, 실린더(181) 의 내부에는 가스가 주입되고, 가스가 피스톤 로드(182)에 가해지는 압력을 통해 피스톤 로드(182)의 위치가 변경된다. 피스톤 로드(182)의 상측에는 내부 가스를 선택적으로 개폐하기 위한 가스 개폐 핀과 가스 개폐 핀을 동작시키기 위한 개폐 가이드가 구비되고, 개폐 가이드에 케이블(189)의 일단이 연결된다. 따라서, 케이블(189)이 당겨지는 동작에 의해 높이조절기구(180) 내의 가스가 이동되고, 압력에 의해 피스톤 로드(182)가 상하 이동될 수 있다. 그리고, 케이블(189)이 당겨지는 힘이 해제되면, 피스톤 로드(182)의 위치는 고정될 수 있다.

[0054] 본 명세서에서 높이조절기구(180)은 버튼부(195)의 동작을 통해 케이블(189)을 당겨져서 전체 길이가 조절되는 구성으로써, 가스 또는 유체의 압력을 이용하여 길이가 조절되는 구성이라면 높낮이 조절 가능한 책상(100)에 채용될 수 있다. 다시 말하면, 높이조절기구(180)은 가스 스프링 외에도 유체 및 공기의 압력을 통해 길이가 가변될 수 있는 유압 실린더도 채용 가능하다.

[0055] 상판(110)의 하부 양측에는 상판(110)의 하면에 결합되며, 케이블(189)의 타단이 끼워지는 버튼부(195)가 배치되도록 조작부(190)가 구비된다. 즉, 본 실시예에서는 높이조절기구(180)이 두 개로 구비된 것을 일 예로 하였으므로, 조작부(190)도 각각 상판(110)의 하부 양측에 각각 구비된다. 따라서, 케이블(189)은 일단이 피스톤 로드(182)에 끼워지고 타단이 버튼부(195)에 끼워져, 버튼부(195)의 가압력이 케이블(189)을 통해 개폐 가이드에 전달됨으로써 높이조절기구(180)의 길이가 가변될 수 있다.

[0056] 이하에서는, 높낮이 조절 가능한 책상(100)의 높낮이를 조절하는 과정에 대해 설명하기로 한다.

[0057] 도 5는 본 발명의 제 1 실시예에 따른 상판이 하부로 이동된 모습을 보인 사시도 이다.

[0058] 도 1 및 도 5를 참조하면, 본 발명의 제 1 실시예에 따른 높낮이 조절 가능한 책상(100)은 상판(110)의 높이가 가변 된다. 사용 예로, 높낮이 조절 가능한 책상(100)은 다른 높낮이 조절 가능한 책상의 상면에 놓여 사용될 수 있다. 이 때, 상판(110)이 도 5에서와 같이 베이스(120)에 가깝게 위치할 경우 사용자는 앉은 상태에서 업무를 수행할 것이다. 그리고, 상판(110)이 도 1에서와 같이 상부로 이동될 경우에는 상판(110)의 눈높이에 맞추어 서있는 상태를 취할 수 있다.

[0059] 조작과정을 상세히 설명하면, 사용자의 조작을 통해 버튼부(195)에 푸쉬가 가해지고, 케이블(189)을 거쳐 높이조절기구(180)에 외력이 전달된다. 즉, 버튼부(195)가 푸쉬된 상태에서는 높이조절기구(180)의 길이가 가변될 수 있는 상태로서 이해된다. 다시 말하면, 버튼부(195)를 푸쉬한 상태에서는 상판(110)이 높이조절기구(180)의 내부에 있는 가스의 압력에 의해 베이스(120)로부터 멀어지도록 상방으로 이동된다. 즉, 높이조절기구(180)은 버튼부(195)의 푸쉬로 인해 내부 가스가 압력을 작용하여, 피스톤 로드(182)가 상방으로 올라옴으로써 길이가 신장되도록 구성될 수 있다.

[0060] 상판(110)의 높이를 높일 경우 버튼부(195)를 푸쉬하게 되고, 상판(110)의 높이를 낮출 경우에는 버튼부(195)를 푸쉬한 상태에서 상판(110)을 하방으로 미는 동작을 취하게 된다. 이러한 사용자의 동작에 의해, 높이조절기구(180)의 높낮이는 가변되고, 제 1 이동부(169)와 제 2 이동부(144)가 각각 제 1 이동 프레임(165)과 제 2 이동 프레임(170)에서 슬라이딩 이동될 수 있다. 상판(110)은 버튼부(195)에 가해지는 가압력을 해제할 경우, 이동 중에도 높이조절이 정지될 수 있다. 따라서, 상판(110)의 높이는 도 1과 도 5에 도시된 높이 사이에서 다양하게 가변될 수 있다.

[0061] 상판(110)이 하방으로 이동되는 것을 예로 들면, 사용자의 하방으로 미는 힘에 의해, 높이조절기구(180)의 길이가 짧아지게 되고, 제 2 이동부(144)는 상기 제 2 이동프레임(170) 상에서 후방으로 슬라이딩 이동 될 것이다. 그리고, 제 1 연결부재(130)와 제 2 연결부재(140)는 베이스(120)와 형성하는 각도가 작아지도록 상측 단부가 하방으로 이동된다.

[0062] 상판(110)이 상방으로 이동될 경우에는, 버튼부(195) 만을 푸쉬함으로써, 높이조절기구(180)의 길이가 길어지고, 제 2 이동부(144)는 제 2 이동프레임(170) 상에서 전방으로 슬라이딩 이동 될 것이다. 그리고, 제 1 연결부재(130)와 상기 제 2 연결부재(140)는 베이스(120)와 형성하는 각도가 커지도록 상측 단부가 상방으로 이동된다.

[0063] 이처럼 높낮이 조절 가능한 책상(100)은 버튼부(195)의 조작을 통한 간단한 동작만으로 상판(110)의 높낮이를 조절할 수 있어, 사용자의 편의성이 증대되는 장점이 있다. 또한, 장시간 앉아 있는 사용자는 상판(110)의 높낮이를 다양하게 조절하여 보다 활동적인 업무를 수행할 수 있을 것이다.

[0065] 도 6a는 본 발명의 제 1 실시예에 따른 높낮이 조절 가능한 책상에 고정다리를 결합한 모습을 보인 사시도이고, 도 6b는 본 발명의 제 1 실시예에 따른 높낮이 조절 가능한 책상에 지지다리를 결합한 모습을 보인 사시도 이며, 도 7은 본 발명의 제 1 실시예에 따른 높낮이 조절 가능한 책상과 고정다리의의 분해 사시도 이다.

[0066] 도 6a 및 도 7을 참조하면, 베이스(120)의 하면에는 높낮이 조절 가능한 책상(100)을 지지하며 높낮이 조절 가능한 책상(100)을 지면으로부터 이격시키는 고정다리(200)가 구비될 수 있다. 전술한 바와 같이, 높낮이 조절 가능한 책상(100)은 다른 높낮이 조절 가능한 책상의 상면에 놓여 사용될 수 있으나 다른 높낮이 조절 가능한 책상이 필요하게 되므로, 고정다리(200)를 통해 높낮이 조절 가능한 책상(100)을 단독으로 사용할 수 있다.

[0067] 고정다리(200)는 베이스(120)의 저면에 결합되는 베이스 결합부(202)와, 하면에 고정다리(200)를 지면으로부터 이격시키는 레그(210)가 결합되는 레그 결합부(209)와, 베이스 결합부(202)와 상기 레그 결합부(209)를 연결시키는 고정다리 몸체(205)를 포함한다.

[0068] 베이스 결합부(202)의 단면 형상은 베이스(120)의 저면의 단면 형상에 대응되도록 형성되어 베이스(120)의 저면에 결합된다. 그리고, 상기 레그 결합부(209)의 하면에는 레그(210)가 구비되어 고정다리(200)가 지면으로부터 이격될 수 있다. 레그(210)는 레그 결합부(209)의 하면 네 모서리에 모두 구비될 수 있다.

[0069] 고정다리 몸체(205)는 베이스 결합부(202)와 레그 결합부(209)를 연결하며, 길이 방향으로 연장되어 높낮이 조절 가능한 책상(100)의 높이를 형성한다. 고정다리 몸체(205)의 높이는 사용자의 의도와 목적에 맞게 다양하게 조절되어 제작될 수 있다.

[0070] 따라서, 높낮이 조절 가능한 책상(100)의 하부에 고정다리(200)를 구비함으로써 높낮이 조절 가능한 책상(100)이 단독으로 사용될 수 있으며, 고정다리(200)가 결합된 상태에서도 상판(110)의 높낮이를 조절함으로써 사용자의 업무환경을 다양하게 변화시킬 수 있다.

[0071] 한편, 도 6b를 참조하면, 베이스(120)의 하면에는 지지다리(199)가 결합될 수 있다. 상기 지지다리(199)는 베이스(120)의 하면 중 네 모서리에 각각 결합되어 높낮이 조절 가능한 책상(100)을 지지할 수 있다.

[0072] 지지다리(199)는, 고정다리 하부(199b)가 고정다리 상부(199a)로 대하여 상하로 이동됨으로써 지면으로부터 높낮이 조절 가능한 책상(100)까지의 상하 길이가 조절되도록 구성될 수 있다.

[0074] 도 8은 본 발명의 제 2 실시예에 따른 높낮이 조절 가능한 책상의 사시도 이고, 도 9는 본 발명의 제 2 실시예에 따른 보조 받침대를 분리한 모습을 보인 사시도 이다.

[0075] 본 실시예는 다른 부분에 있어서는 제 1 실시예와 동일하고, 다만 보조 받침대에 있어서 차이가 있다. 따라서, 이하에서는 본 실시예의 특징적인 부분에 대해서만 설명하고 제 1 실시예와 동일한 부분은 제 1 실시예를 원용하기로 한다.

[0076] 도 8 및 도 9를 참조하면, 본 실시예에 따른 높낮이 조절 가능한 책상(220)에는, 상판(110)의 하측에 배치되는 판 형상의 보조 받침대(230)를 더 포함할 수 있다. 보조 받침대(230)는 상면이 제 2 결합부(145) 중 제 2 수직부(147)의 하면에 결합된다.

[0077] 상세히, 보조 받침대(230)에는 상면으로부터 하면을 관통하는 링크홀(231)이 형성될 수 있다. 링크홀(231)은 보조 받침대(230)의 후방에 인접하여 양측에 각각 형성된다. 그리고, 제 2 수직부(147)의 하면에는 보조 받침대(230)와 제 2 수직부(147)를 결합시키기 위한 링크부재(148)가 끼워지도록 링크홈(미도시)이 형성된다.

[0078] 보조 받침대(230)의 결합은, 상판(110)의 하부 양측에 복수로 배치되는 제 2 수직부(147)의 하면에, 링크홀(231)과 링크홈이 서로 대응되도록 보조 받침대(230)가 맞대어, 링크부재(148)를 통해 이루어질 수 있다. 추가로 링크홀(231) 및 링크부재(148)의 개수를 늘림으로써 보다 견고하게 보조 받침대(230)를 상판(110)의 하측에

고정시키는 것도 가능하다.

[0079] 따라서, 본 실시예에서는 높낮이 조절 가능한 책상(220)에 보조 받침대(230)를 추가로 구비함으로써 보다 많은 업무도구가 놓여질 수 있다. 일 예로 상판(110)의 상면에 컴퓨터 모니터가 배치될 경우 보조 받침대(230)의 상면에는 키보드를 구비함으로써, 상판(110)의 상면에 보다 넓은 여유 공간을 갖출 수 있다.

[0080] 한편, 베이스(120)에는, 가장자리를 따라 베이스(120)의 상면이 가려지도록 측벽(125)이 구비될 수 있다. 측벽(125)은 베이스(120)의 상면 보다 높은 높이를 갖도록 형성되어 베이스(120)의 측면에 결합된다. 측벽(125)이 결합될 경우, 상기 베이스(120)의 상면에 먼지, 이물질 등이 쌓이는 것을 방지할 수 있고, 높낮이 조절 가능한 책상(220)의 외관을 보다 세련되게 형성할 수 있는 장점이 있다.

[0082] 도 10은 본 발명의 제 3 실시예에 따른 높낮이 조절 가능한 책상의 사시도 이고, 도 11은 본 발명의 제 3 실시예에 따른 높이조절기구의 결합구조를 설명하기 위한 확대도 이며, 도 12는 본 발명의 제 3 실시예에 따른 상판이 하부로 이동된 모습을 보인 사시도 이다.

[0083] 본 실시예는 다른 부분에 있어서는 제 1 실시예와 동일하고, 다만 높이조절기구의 결합 위치에 있어서 차이가 있다. 따라서, 이하에서는 본 실시예의 특징적인 부분에 대해서만 설명하고 제 1 실시예와 동일한 부분은 제 1 실시예를 원용하기로 한다.

[0084] 도 10 내지 도 12를 참조하면, 본 발명의 제 3 실시예에 따른 높낮이 조절 가능한 책상(300)은, 높이조절기구(180)이 베이스(120)의 상면에 구비된다.

[0085] 상세히, 높낮이 조절 가능한 책상(300)은 상판(110)과 하판(120), 그리고 상판(110)과 하판(120)의 사이에서 상판(110)을 상대 이동시키기 위한 상기 제 1 연결부재(130) 및 제 2 연결부재(140)를 포함한다. 그리고, 제 2 연결부재(140)의 일단은 상판(110)의 전방 측 상면에 구비되는 제 2 결합부(145)의 제 2 수직부(147)와 힌지 결합되고, 제 2 연결부재(140)의 타단은 제 2 이동프레임(170) 상에 슬라이딩 이동되는 제 2 이동부(144)의 일면에 힌지 결합된다.

[0086] 이 때, 높이조절기구(180)은 제 2 연결부재(140)의 타단에서 제 2 이동부(144)와 결합되는 면의 반대면에 피스톤 로드(182)의 단부가 결합된다. 즉, 제 2 연결부재(140) 타단의 일면은 제 2 이동부(144)와 결합되고, 제 2 연결부재(140) 타단의 타면은 피스톤 로드(182)의 단부가 결합된다. 경우에 따라서, 피스톤 로드(182)은 단부에 형성된 홀(182a, 도 4 참조)을 통해 제 2 연결부재(140)의 타단을 관통하여 제 2 이동부(144)에 삽입되는 핀(P)을 통해 결합될 수 있다.

[0087] 따라서, 높이조절기구(180)은 피스톤 로드(182)의 단부가 제 2 연결부재(140)의 타단에 결합된 상태로 실린더(181)의 베이스(120)의 후방으로 연장되어 베이스(120)의 상면에 위치될 수 있다. 한편, 제 1 실시예와 동일하게 상 피스톤 로드(182)의 일측에서 연장되어 개폐 가이드를 선택적으로 가압하기 위한 케이블(189)은, 상판(110)의 하면에 구비되는 버튼부(195)에 연결됨으로써 사용자에 의해 조작된다.

[0088] 그리고, 본 발명의 제 3 실시예의 따른 높낮이 조절 가능한 책상(300)의 높낮이 조절은 제 1 실시예의 따른 높낮이 과정과 동일하게 이루어진다. 즉, 사용자는 버튼부(195)를 푸쉬한 상태에서 상판(110)을 하방으로 밀거나 상방으로 당기는 동작에 의해, 상판(110)의 높낮이를 조절할 수 있다.

[0090] 도 13은 본 발명의 제 4 실시예에 따른 높낮이 조절 가능한 책상의 사시도 이고, 도 14는 본 발명의 제 4 실시예에 따른 상판과 베이스를 분리한 높낮이 조절 가능한 책상이 도시된 사시도 이며, 도 15는 본 발명의 제 4 실시예에 따른 상판이 하부로 이동된 모습을 보인 사시도 이다.

[0091] 본 실시예는 다른 부분에 있어서는 제 1 실시예와 동일하고, 다만 높이조절기구의 위치에 있어서 차이가 있다. 따라서, 이하에서는 본 실시예의 특징적인 부분에 대해서만 설명하고 제 1 실시예와 동일한 부분은 제 1 실시예를 원용하기로 한다.

[0092] 도 13 내지 도 15를 참조하면, 본 발명의 제 4 실시예에 따른 높낮이 조절 가능한 책상(400)은, 상판(110)이 베이스(120)의 상부에서 제 2 연결부재(140)와 높이조절기구(180)을 통해 지지된다. 즉, 본 실시예에서는 제 1 연결부재(130)가 제외된다.

[0093] 상세히, 제 2 연결부재(140)는 일단이 상판(110)의 전방 측 하면에 구비되는 제 2 결합부(145)와 결합되고, 타단이 베이스(120)의 후방 측 상면에 구비되는 제 2 이동프레임(170)에 슬라이딩 이동되는 제 2 이동부(144)에 결합된다. 그리고, 높이조절기구(180)은 일단이 베이스(120)의 전방 측 상면에 구비되는 제 1 결합부(160)와 결

합되고, 타단이 상판(110)의 후방 측 저면에 구비되는 제 1 이동프레임(165)에 슬라이딩 이동되는 제 1 이동부(169)와 결합된다. 다시 말하면, 본 발명의 제 1 실시예의 따른 제 1 연결부재(130)의 위치에 높이조절기구(180)이 배치되는 것이다.

[0094] 높이조절기구(180)의 일단은 실린더(181)의 단부에 형성된 홀(184a, 도 4참조)을 관통하는 핀(403)을 통해 제 1 수직부(162)의 일면에 결합된다. 그리고, 높이조절기구(180)의 타단은 피스톤 로드(182)의 단부에 형성된 홀(182a)을 관통하는 핀(405)을 통해 제 1 이동부(169)의 일면에 결합된다. 핀들(403, 405)을 통한 결합은 힌지 결합일 수 있다.

[0095] 따라서, 본 실시예에서는 높이조절기구(180)가 상판(110)과 베이스(120)의 사이에 구비되어 피스톤 로드(182)의 상하 이동에 따라 길이가 가변된다. 즉, 도 15에 도시된 바와 같이 피스톤 로드(182)는 실린더(181)의 내부로 삽입되어 높이조절기구(180)의 길이가 짧아지면 상판(110)은 하방으로 이동되고, 피스톤 로드(182)는 상기 실린더(181)의 외부로 빠짐으로써 높이조절기구(180)의 길이가 길어지면 상기 상판(110)은 상방으로 이동된다.

[0096] 본 실시예에 따른 높낮이 조절 가능한 책상(400)의 조작방법은 버튼부(195)의 조작을 통해 이루어지는 제 1 실시예에 따른 높낮이 조절 가능한 책상(100)의 조작방법과 동일하므로, 이에 대한 설명은 생략하기로 한다.

[0097] 따라서, 본 실시예에서는 제 1 연결부재를 높이조절기구(180)로 대체함으로써, 부품수가 줄어들고 이에 따라 제조 단가가 저렴해지는 장점이 있다.

[0099] 도 16은 본 발명의 제 5 실시예에 따른 높낮이 조절 가능한 책상이 도시된 사시도이고, 도 17는 본 발명의 제 5 실시예의 상판이 상승되었을 때의 측면도이며, 도 18는 본 발명의 제 5 실시예의 상판이 최저 높이로 하강되었을 때의 측면도이다.

[0100] 도 16 내지 도 18을 참고하면, 높낮이 조절 가능한 책상은 베이스(120)와; 상판(110)과; 베이스(120)와 상판(110) 사이에 배치되어 상판(110)을 승강 가능하게 지지하는 링크 기구(L)를 포함할 수 있다.

[0101] 상판(110)은 탑 플레이트(111)와, 탑 플레이트(111)의 하부에 결합된 상부 프레임(112)을 포함할 수 있다.

[0102] 탑 플레이트(111)는 판체 형상으로 형성될 수 있고, 사용자는 탑 플레이트(111)의 상면에 모니터나 전화기나 각종 서류 등을 올려놓을 수 있다.

[0103] 상부 프레임(112)은 복수개가 탑 플레이트(111) 하부에 배치될 수 있다. 이 경우, 복수개의 상부 프레임(112)는 탑 플레이트(111) 하부에 좌우 방향으로 이격되게 위치될 수 있다. 복수개의 상부 프레임(112)는 탑 플레이트(111)의 좌측부 아래에 배치되는 좌측 상부 프레임과, 탑 플레이트(111)의 우측부 아래에 배치되는 우측 상부 프레임을 포함할 수 있다.

[0104] 상부 프레임(112)은 한 쌍의 링크(L1)(L2) 중 어느 하나와 힌지 결합될 수 있고, 한 쌍의 링크(L1)(L2) 중 다른 하나를 안내할 수 있다. 상부 프레임(112)는 탑 플레이트(111)의 저면에 위치되게 탑 플레이트(111)에 체결될 수 있다. 상부 프레임(112)은 탑 플레이트(111)에 스크류 등의 체결부재나 후크 등의 걸이부에 의해 장착될 수 있다. 상부 프레임(112)은 탑 플레이트(111)에 체결되는 상판부와, 상판부에서 수직하게 절곡된 측판부를 포함할 수 있다.

[0105] 상판(110)은 탑 플레이트(111)와 이격되는 로어 플레이트(113)를 더 포함할 수 있다. 로어 플레이트(113)은 탑 플레이트(111)와 높이차를 갖게 배치될 수 있다. 사용자는 로어 플레이트(113) 상면에 키보드나 마우스 등을 올려놓을 수 있다.

[0106] 로어 플레이트(113)은 플레이트 커넥터(114)를 통해 탑 플레이트(111)와 상부 프레임(112) 중 적어도 하나에 연결될 수 있다. 플레이트 커넥터(114)는 탑 플레이트(111)와 로어 플레이트(113)가 단차를 갖고 위치되게 설치될 수 있고, 로어 플레이트(113)는 플레이트 커넥터(114)에 매달려서 유지될 수 있다. 로어 플레이트(113)는 플레이트 커넥터(114)의 하부에 스크류 등의 체결부재나 후크 등의 걸이부에 의해 장착될 수 있다.

[0107] 플레이트 커넥터(114)는 복수개가 탑 플레이트(111) 하부에 배치될 수 있다. 복수개의 플레이트 커넥터(114)는 탑 플레이트(111) 하부에 좌우 방향으로 이격되게 위치될 수 있다. 복수개의 플레이트 커넥터(114)는 탑 플레이트(111)의 좌측부 아래에 배치되는 좌측 플레이트 커넥터와, 탑 플레이트(111)의 우측부 아래에 배치되는 우측 플레이트 커넥터를 포함할 수 있다.

[0108] 로어 플레이트(113)은 좌측 플레이트 커넥터와 우측 플레이터 커넥터에 연결될 수 있다.

[0109] 베이스(120)는 하부 프레임(121)을 포함할 수 있다. 하부 프레임(121)은 상판(110)과 상하 방향으로 이격되게 위치될 수 있다. 하부 프레임(121)은 복수개가 이격되게 배치될 수 있다. 복수개의 하부 프레임(121)은 상판(110)의 좌측 아래에 위치하는 좌측 하부 프레임과, 상판(110)의 우측 아래에 위치하는 우측 하부 프레임을 포함할 수 있다. 좌측 하부 프레임과 우측 하부 프레임은 좌우 방향으로 이격되게 위치될 수 있다.

[0110] 베이스(120)는 복수개의 하부 프레임을 연결하는 프레임 커넥터(123)을 더 포함할 수 있다. 좌측 하부 프레임과 우측 하부 프레임은 프레임 커넥터(123)에 의해 연결될 수 있다. 좌측 하부 프레임은 상판(110)의 아래에 전후 방향으로 길게 배치될 수 있고, 우측 하부 프레임은 상판(110)의 아래에 전후 방향으로 길게 배치될 수 있으며, 좌측 하부 프레임과 우측 하부 프레임은 좌우 방향으로 이격될 수 있다. 프레임 커넥터(123)는 좌측 하부 프레임과 우측 하부 프레임을 잇게 좌우 방향으로 길게 배치될 수 있고, 좌측부가 좌측 하부 프레임에 연결될 수 잇고, 우측부가 우측 하부 프레임에 연결될 수 있다.

[0111] 링크 기구(L)는 좌측 하부 프레임과 좌측 상부 프레임을 잇는 좌측 링크 기구와, 우측 하부 프레임과 우측 상부 프레임을 잇는 우측 링크기구를 포함할 수 있다.

[0112] 링크 기구(L)는 회동 축(150)으로 회전 가능하게 연결된 한 쌍의 링크(L1)(L2)를 포함할 수 있다. 좌측 링크 기구와 우측 링크 기구는 동일한 구조로 구성될 수 있고, 탑 플레이트(111)의 하측에 좌,우 대칭되게 배치될 수 잇다. 좌측 링크 기구와 우측 링크 기구 각각은 회동 축(150)으로 회전 가능하게 한 쌍의 링크(L1)(L2)를 포함할 수 있다.

[0113] 이하, 좌측 링크 기구와 우측 링크 기구가 동일 구조로 이루어지므로, 이하 중복된 설명을 피하기 위해 링크 기구(L)로 칭하여 설명한다.

[0114] 한 쌍의 링크(L1)(L2) 중 적어도 하나는 상판(110)의 최대 하강시 상판(110)과 베이스(120) 사이에 설정 높이의 틈(G)을 형성하는 틈 형성부(130A)(140A)를 포함할 수 있다.

[0115] 높낮이 조절 가능한 책상은 상판(110)이 베이스(120)와 접촉되지 않는 높이까지만 하강되게 구성될 수 있고, 이러한 설정 높이의 틈(G)은 사용자의 손가락 등의 신체 일부가 상판(110)과 베이스(120) 사이에 끼는 것을 막을 수 있고, 높낮이 조절 가능한 책상의 안전성은 향상될 수 있다.

[0116] 높낮이 조절 가능한 책상은 상판(110)이 소정 높이 이하로 하강될 때, 상판(110)과 베이스(120) 중 어느 하나에 설치되고 설정 높이를 갖는 별도의 스페이서가 상판(110)과 베이스(120) 중 다른 하나에 접촉되어 상판(110)과 베이스(120)가 설정 높이의 틈(G)을 형성할 수 있다. 이 경우, 상판(110)과 베이스(120) 중 어느 하나에 설치된 스페이서는 틈 형성부가 될 수 있다.

[0117] 높낮이 조절 가능한 책상은 상판의 높이가 낮아지게 한 쌍의 링크(L1)(L2)가 접혀질 때, 한 쌍의 링크(L1)(L2) 중 어느 하나에 돌출되게 구비된 돌출부가 한 쌍의 링크(L1)(L2) 중 다른 하나에 접촉되어 한 쌍의 링크(L1)(L2)가 소정 각도 미만으로 접혀지지 않게 제한할 수 있고, 상판(110)과 베이스(120)는 설정 높이의 틈(G)을 형성할 수 있다. 이 경우, 한 쌍의 링크(L1)(L2) 중 어느 하나에 돌출되게 구비된 돌출부는 틈 형성부가 될 수 있다.

[0118] 높낮이 조절 가능한 책상은 상판(110)이 소정 높이 이하로 하강될 때, 상판(110)이 자력에 의해 소정 높이 미만으로 하강되지 않게 제한하는 마그네트를 포함할 수 있다. 마그네트는 상판(110)과 베이스(120)에 서로 척력을 작용하는 방향으로 마그네트가 설치될 수 있다. 이 경우, 상판(110)과 베이스(120)에 서로 척력을 작용하게 설치된 마그네트는 틈 형성부가 될 수 있다.

[0119] 상기와 같은 틈 형성부는 상판(110)의 최대 하강시 상판(110)과 베이스(120) 사이에 설정 높이의 틈(G)을 형성할 수 있는 구조이면, 다양한 구조의 것이 적용 가능하다.

[0120] 높낮이 조절 가능한 책상은 구조가 간단하고 설정 높이의 틈을 신뢰성 높게 실현할 수 있는 틈 형성부를 갖는 것이 바람직하다.

[0121] 본 실시예는 한 쌍의 링크(L1)(L2) 자체가 상판(120)과 베이스(110) 사이에 설정 높이의 틈을 형성할 수 있는 구조로 이루어지는 것이 바람직하고, 한 쌍의 링크(L1)(L2)는 적어도 1회 절곡된 구조로 이루어질 수 있다.

[0122] 한 쌍의 링크(L1)(L2) 각각은 틈 형성부(130A)(140A)에 서로 상이한 방향으로 높이차를 갖게 돌출된 한 쌍의 링크부를 포함할 수 있다.

[0123] 한 쌍의 링크부는 상판(110)이 최대로 하강되었을 때, 둘 중 하나가 다른 하나 보다 더 높게 위치될 수 있고, 이러한 높이 차에 의해 상판(110)은 베이스(120)와 접촉되지 못하고, 상판(110)과 베이스(120)의 사이에는 설정 높이의 틈이 형성될 수 있다.

[0124] 한 쌍의 링크(L1)(L2) 각각은 틈 형성부(130A)(140A)와, 틈 형성부(130A)(140A)와 둔각을 갖고 베이스(120)와 상판(110) 중 어느 하나에 힌지 연결된 제 1 링크부(130B)(140B)와; 틈 형성부(130A)(140A)와 둔각을 갖고 베이스(120)와 상판(110) 중 다른 하나에 안내되는 이동부(169)(144)가 설치된 제 2 링크부(130C)(140C)를 포함할 수 있다.

[0125] 한 쌍의 링크(L1)(L2) 중 어느 하나(L1)는 하부 프레임(121)의 대략 전방부에 힌지 핀(130D)으로 힌지 연결된 제 1 링크부(130B)와, 상부 프레임(112)를 따라 안내되는 이동부(169)가 힌지 핀(169A)으로 힌지 연결된 제 2 링크부(130C)와, 제 1 링크부(130B)와 제 2 링크부(130C)를 잇는 틈 형성부(130A)를 포함할 수 있다.

[0126] 한 쌍의 링크(L1)(L2) 중 어느 하나(L1)는 상판(110)의 최대 하강시, 제 2 링크부(130C)가 제 1 링크부(130B)보다 더 높게 위치될 수 있다. 상판(110)은 제 2 링크부(130B)와 제 1 링크부(130B)의 높이 차 만큼 하강되지 못할 수 있다.

[0127] 한 쌍의 링크(L1)(L2) 중 어느 하나(L1)는 틈 형성부(130A)와, 제 1 링크부(130B) 및 제 2 링크부(130C)가 본 발명 제 1 실시예의 제 1 연결부재(130)로 기능할 수 있다. 그리고, 제 2 링크부(130C)에 힌지 핀(169A)으로 힌지 연결된 이동부(169)는 본 발명 제 1 실시예의 제 1 이동부(169)로 기능할 수 있다.

[0128] 한 쌍의 링크(L1)(L2) 중 다른 하나(L2)는 상부 프레임(112)의 대략 전방부에 힌지 핀(140D)으로 힌지 연결된 제 1 링크부(140B)와, 상부 프레임(112)를 따라 안내되는 이동부(144)가 힌지 핀(114A)으로 힌지 연결된 제 2 링크부(140C)와, 제 1 링크부(140B)와 제 2 링크부(140C)를 잇는 틈 형성부(140A)를 포함할 수 있다.

[0129] 한 쌍의 링크(L1)(L2) 중 다른 하나(L2)는 상판(110)의 최대 하강시, 제 2 링크부(140B)가 제 1 링크부(140B)보다 더 낮게 위치될 수 있다. 상판(110)은 제 2 링크부(140B)와 제 1 링크부(140B)의 높이 차 만큼 하강되지 못할 수 있다.

[0130] 한 쌍의 링크(L1)(L2) 중 다른 하나(L2)는 틈 형성부(140A)와, 제 1 링크부(140B) 및 제 2 링크부(140C)가 본 발명 제 1 실시예의 제 2 연결부재(140)로 기능할 수 있다. 그리고, 제 2 링크부(140C)에 힌지 핀(144A)으로 힌지 연결된 이동부(144)는 본 발명 제 1 실시예의 제 2 이동부(144)로 기능할 수 있다.

[0131] 틈 형성부(130A)(140A)에는 회동 축(150)이 회전 가능하게 관통되는 회동 축 관통공이 형성될 수 있고, 틈 형성부(130A)(140A)는 한 쌍의 링크(L1)(L2) 중 회동 축(150)이 연결되는 회동 축 연결부가 될 수 있다.

[0132] 본 실시예는 한 쌍의 링크(L1)(L2) 중 어느 하나에 피스톤 로드(182)가 연결된 높이조절기구(180)을 더 포함할 수 있다. 본 실시예의 높이조절기구(180)은 그 구성 및 기능이 본 발명 제 1 실시예의 높이조절기구와 동일하므로 그에 대한 상세한 설명은 생략한다.

[0133] 높이조절기구(180)는 피스톤 로드(182)는 한 쌍의 링크(L1)(L2) 중 어느 하나(L1)에 회전 가능하게 연결될 수 있다.

[0134] 피스톤 로드(182)는 한 쌍의 링크(L1)(L2) 중 어느 하나(L1)에 연결되는 힌지 축(182b)가 구비될 수 있고, 피스톤 로드(182)는 힌지 축(182b)을 중심으로 회전될 수 있다.

[0135] 높이조절기구(180)은 하부에 힌지 축(184b)이 구비될 수 있고, 힌지축(184b)은 한 쌍의 링크(L1)(L2) 중 다른 하나(L2)에 힌지 연결될 수 있다. 힌지 축(184b)는 높이조절기구(180)의 실린더에 구비될 수 있고, 높이조절기구(180)의 실린더는 한 쌍의 링크(L1)(L2) 중 다른 하나(L2)를 중심으로 회전될 수 있다.

[0136] 본 실시예는 본 발명 제 1 실시예와 같은 결합축(155) 없이, 높이조절기구(180)가 한 쌍의 링크 링크(L1)(L2) 중 다른 하나(L2)에 직접 연결될 수 있다. 한 쌍의 링크(L1)(L2) 중 다른 하나(L2)에는 힌지 축(184b)이 회전 가능하게 지지되는 힌지 홀(140E)가 형성될 수 있다.

[0137] 본 실시예는 상판(110)에 회전 가능하게 연결된 조작 레버(295)와; 조작 레버(295)에 연결된 케이블(미도시)과; 케이블(미도시)에 연결되고 피스톤 로드(182)가 한 쌍의 링크(L1)(L2) 중 하나(L2)에 연결된 높이조절기구(180)을 포함할 수 있다.

[0138] 조작 레버(295)는 본 발명 제 1 실시예의 버튼부(195) 대신에 설치될 수 있다. 조작 레버(295)는 상판

(110)에 수평 회전축을 중심으로 회전되게 설치될 수 있고, 사용자가 조작 레버(295)를 잡고 상측으로 회동시킬 때 케이블이 작동되어 높이조절기구(180)을 조작시킬 수 있다. 본 실시예의 케이블은 본 발명 제 1 실시예의 케이블이 적용될 수 있고, 본 실시예의 높이조절기구(180)은 본 발명 제 1 실시예의 높이조절기구(180)이 적용될 수 있다. 케이블과 높이조절기구(180)은 본 발명 제 1 실시예와 동일하므로 그에 대한 상세한 설명은 생략한다.

[0139] 상판(110)에는 수평 회전축을 회전 가능하게 지지하는 수평 회전축 지지부(118)이 구비될 수 있다. 수평 회전축 지지부(118)는 탑 플레이트(111)와 상부 프레임(112)와 플레이트 커넥터(114) 중 어느 하나에 구비될 수 있다.

[0140] 한편, 상판(110)의 상부 프레임(112)는 한 쌍의 링크(L1)(L2) 중 다른 하나(L2)가 힌지 연결되는 힌지 연결부(112A)와, 한 쌍의 링크(L1)(L2) 중 어느 하나(L1)가 안내되는 가이드부(112B)가 함께 형성될 수 있고, 이를 위해 전후 방향으로 길게 형성될 수 있다. 여기서, 힌지 연결부(112A)는 본 발명 제 1 실시예의 제 2 결합부(145)와 대응되는 구성일 수 있고, 가이드부(112B)는 본 발명 제 1 실시예의 제 1 이동 프레임(165)와 대응되는 구성일 수 있다. 본 실시예의 하부 프레임(112)은 힌지 연결부(112A)와, 가이드부(112B)가 별도의 부재로 구성되는 경우 보다 부품수를 최소화할 수 있다.

[0141] 베이스(120)의 하부 프레임(121)은 한 쌍의 링크(L1)(L2) 중 어느 하나(L1)가 힌지 연결되는 힌지 연결부(121A)와, 한 쌍의 링크(L1)(L2) 중 다른 하나(L2)가 안내되는 가이드부(121B)가 함께 형성될 수 있고, 이를 위해 전후 방향으로 길게 형성될 수 있다. 여기서, 힌지 연결부(121A)는 본 발명 제 1 실시예의 제 1 결합부(160)와 대응되는 구성일 수 있고, 가이드부(121B)는 본 발명 제 1 실시예의 제 2 이동 프레임(170)와 대응되는 구성일 수 있다. 본 실시예의 하부 프레임(121)은 힌지 연결부(121A)와, 가이드부(121B)가 별도의 부재로 구성되는 경우 보다 부품수를 최소화할 수 있다.

[0143] 본 실시예의 작용을 설명하면 다음과 같다.

[0144] 먼저, 사용자는 조작 레버(295)를 손으로 잡고 상측 방향으로 올릴 수 있고, 조작 레버(295)는 수평 회전축 지지부(118)에 지지된 수평 회전축을 중심으로 상측 방향으로 회전될 수 있다. 조작 레버(295)의 회전시, 조작 레버(295)에 연결된 케이블은 높이조절기구(180)에 외력을 전달할 수 있고, 높이조절기구(180) 내부의 피스톤 로드(182)에는 가스의 압력이 작용할 수 있으며, 높이조절기구(180)는 피스톤 로드(182)가 상판(110)을 상승시키는 방향으로 전진될 수 있다.

[0145] 상기와 같이, 상판(110)이 들어올려질 때, 제 1 링크(L1)의 이동부(169)는 상부 프레임(112)를 따라 상부 프레임(112)의 전방 방향으로 이동될 수 있고, 제 1 링크(L1)은 하부 프레임(121)의 힌지 연결부(121A)를 중심으로 상측 방향으로 점차 세워질 수 있다.

[0146] 그리고, 상판(110)이 들어올려질 때, 제 2 링크(L2)의 이동부(144)는 하부 프레임(121)을 따라 하부 프레임(121)의 전방 방향으로 이동될 수 있고, 제 2 링크(L2)는 상부 프레임(112)의 힌지 연결부(112A)를 중심으로 회전되면서 점차 세워질 수 있다.

[0147] 상기와 같은 제 1 링크(L1)과 제 2 링크(L2)의 회전시, 제 1 링크(L1)과 제 2 링크(L2)는 제 1 링크(L1)의 틈 형성부(130A)와 제 2 링크(L2)의 틈 형성부(140B)가 회동 축(150)으로 연결된 상태에서 펼쳐질 수 있고, 상판(110)은 제 1 링크(L1)와 제 2 링크(L2)에 지지된 상태에서 상측 방향으로 상승될 수 있다.

[0148] 상기와 같은 상판(110)의 상승시, 제 2 링크(L2)의 제 1 링크부(140B)는 제 1 링크(L1)의 제 1 링크부(130B) 보다 높게 상승될 수 있고, 제 1 링크(L2)의 제 2 링크부(130C)는 제 2 링크(L2)의 제 2 링크부(140C) 보다 높게 상승될 수 있다.

[0149] 제 2 링크(L2)의 제 1 링크부(140B)와 제 1 링크(L1)의 제 1 링크부(130B)의 사이의 각도가 커질 때, 제 1 링크(L2)의 제 2 링크부(130C)와 제 2 링크(L2)의 제 2 링크부(140C) 사이의 각도는 커질 수 있고, 상판(110)의 높이는 높아질 수 있다.

[0150] 한편, 사용자는 상판(110)이 희망하는 높이에 이르면, 상판(110)을 더 이상 들어올리지 않고, 조작 레버(295)에 가하던 외력을 제거할 수 있다. 조작 레버(295)는 외력이 제거됨에 따라 수평 회전축을 중심으로 하측 방향으로 회전될 수 있다. 조작 레버(295)의 하측 방향 회전시, 케이블에 작용하는 외력은 해제되고, 피스톤 로드(182)의 위치는 고정된다.

[0151] 피스톤 로드(182)의 위치 고정시, 높이조절기구(180)은 제 1 링크(L1)와 제 2 링크(L2) 중 힌지 연결된 링크(L2)에 지지될 수 있고, 피스톤 로드(182)는 상판(110)을 지탱하여 상판(110)이 임의 하강되는 것을 막을 수 있

다.

[0152] 사용자는 상판(110)이 도 17에 도시된 바와 같이, 상승되어 고정된 상태에서, 높낮이 조절 가능한 책상을 사용할 수 있다.

[0153] 사용자는 상판(110)의 높이를 낮추고자 할 경우, 조작 레버(295)를 손으로 잡고 상측 방향으로 다시 올릴 수 있고, 조작 레버(295)는 수평 회전축 지지부(118)에 지지된 수평 회전축을 중심으로 상측 방향으로 회전될 수 있다. 조작 레버(295)의 회전시, 조작 레버(295)에 연결된 케이블은 높이조절기구(180)에 외력을 전달할 수 있고, 높이조절기구(180) 내부의 피스톤 로드(182)에는 가스의 압력이 작용할 수 있으며, 높이조절기구(180)은 피스톤 로드(182)가 상판(110)을 하강시키는 방향으로 직선 이동 가능한 상태가 될 수 있다.

[0154] 사용자가 상기와 같이, 조작 레버(295)를 상측 방향으로 회전시킨 상태에서 상판(110)을 내릴 수 있고, 높이조절기구(180)의 피스톤 로드(182)는 높이조절기구(180) 내부를 향하는 방향으로 후퇴될 수 있다.

[0155] 상기와 같이, 상판(110)이 내려질 때, 제 1 링크(L1)의 이동부(169)는 상부 프레임(112)를 따라 상부 프레임(112)의 후방 방향으로 이동될 수 있고, 제 1 링크(L1)은 하부 프레임(121)의 힌지 연결부(121A)를 중심으로 하측 방향으로 회전될 수 있다.

[0156] 그리고, 상판(110)이 내려질 때, 제 2 링크(L2)의 이동부(144)는 하부 프레임(121)을 따라 하부 프레임(121)의 후방 방향으로 이동될 수 있고, 제 2 링크(L2)는 상부 프레임(112)의 힌지 연결부(112A)를 중심으로 하측 방향으로 회전될 수 있다.

[0157] 상기와 같은 제 1 링크(L1)과 제 2 링크(L2)의 회전시, 제 1 링크(L1)과 제 2 링크(L2)는 제 1 링크(L1)의 틈 형성부(130A)와 제 2 링크(L2)의 틈 형성부(140B)가 회동 축(150)으로 연결된 상태에서 접혀질 수 있고, 상판(110)은 제 1 링크(L1)와 제 2 링크(L2)에 지지된 상태에서 하측 방향으로 하강될 수 있다.

[0158] 상기와 같은 상판(110)의 하강시, 제 2 링크(L2)의 제 1 링크부(140B)는 제 1 링크(L1)의 제 1 링크부(130B)와 근접하게 하강될 수 있고, 제 1 링크(L2)의 제 2 링크부(130C)는 제 2 링크(L2)의 제 2 링크부(140C)와 근접하게 하강될 수 있다.

[0159] 제 2 링크(L2)의 제 1 링크부(140B)와 제 1 링크(L1)의 제 1 링크부(130B)의 사이의 각도가 작아질 때, 제 1 링크(L2)의 제 2 링크부(130C)와 제 2 링크(L2)의 제 2 링크부(140C) 사이의 각도는 작아질 수 있고, 상판(110)의 높이는 낮아질 수 있다.

[0160] 상기와 같은 상판(110)의 하강시, 제 1 링크(L1)와 제 2 링크(L2)는 제 1 링크부와 틈 형성부와 제 2 링크부의 절곡 구조에 의해 도 18과 같이 상판(110)과 베이스(120)의 사이에 설정 높이의 틈(G)이 형성되는 위치에 정지될 수 있고, 상판(110)는 베이스(120)와 설정 높이의 틈(G)을 형성하는 위치까지만 하강될 수 있다. 상판(110)과 베이스(120) 사이에 설정 높이의 틈(G)이 형성되는 경우, 상판(110)과 베이스(120) 사이에 사용자의 손가락이 끼이는 것을 막을 수 있고, 상판(110)과 베이스(120) 사이에 사용자의 손가락이 끼이는 안전사고를 예방할 수 있다.

[0161] 한편, 사용자는 상판(110)이 베이스(120)와 설정 높이의 틈(G)을 형성하는 높이로 하강되고, 더 이상 하강되지 않으면, 조작 레버(295)에 가하던 외력을 제거할 수 있다. 조작 레버(295)는 외력이 제거됨에 따라 수평 회전축을 중심으로 하측 방향으로 회전될 수 있다. 조작 레버(295)의 하측 방향 회전시, 케이블에 작용하는 외력은 해제되고, 피스톤 로드(182)의 위치는 고정되며, 상판(110)은 도 18에 도시된 바와 같이, 베이스(120)와 설정 높이의 틈(G)을 형성하는 높이에 위치 고정될 수 있다.

[0163] 도 19은 본 발명의 제 6 실시예의 상판이 스토퍼에 의해 상승 제한될 때의 단면도이고, 도 20은 본 발명의 제 6 실시예의 상판이 스토퍼에 의해 하강 제한될 때의 단면도이다.

[0164] 본 실시예는 하부 프레임(121)에 한 쌍의 링크(L1)(L2) 중 하나(L2)가 걸리는 스토퍼(500)가 설치될 수 있다. 스토퍼(500)는 한 쌍의 링크(L1)(L2) 중 하나의 이동 경로(P1부터 P2까지) 상에 위치 가변되게 설치될 수 있다. 본 실시예는 스토퍼(500) 이외의 구성 및 작용이 본 발명 제 1 실시예 내지 제 5 실시예 중 어느 하나와 동일하거나 유사하고, 그에 대한 상세한 설명은 생략한다. 편의를 위해 제 5 실시예와 동일한 구성에 대해서 제 5 실시예와 동일 도면부호를 사용하고 그에 대한 상세한 설명은 생략한다.

[0165] 스토퍼(500)가 설치되지 않을 경우, 한 쌍의 링크(L1)(L2) 중 하나의 이동부(144)는 하부 프레임(121)의 이동 경로(P1부터 P2까지)를 따라 전후 안내될 수 있다.

[0166] 스토퍼(500)가 설치되지 않을 경우, 이동부(144)는 전방 방향(F)으로 최대 전진되는 위치인 최전방 위치(P1)와, 후방 방향(R)로 최대 후퇴되는 휘치인 최후방 위치(P2)로 이동될 수 있다.

[0167] 스토퍼(500)는 이동부(144)가 최전방 위치(P1)를 향해 전진될 때, 도 19에 도시된 바와 같이, 이동부(144)가 최전방 위치(P1)로 도달되기 이전에 구속되게 하부 프레임(121)에 설치될 수 있고, 최전방 위치(P1)를 향해 전진되던 이동부(144)는 스토퍼(500)에 전방 방향(F)으로 걸려 더 이상 전방 방향으로 전진되지 못할 수 있다.

[0168] 반대로, 스토퍼(500)는 이동부(144)가 최후방 위치(P2)를 향해 후퇴될 때, 도 20에 도시된 바와 같이, 이동부(144)가 최후방 위치(P2)로 도달되기 이전에 구속되게 하부 프레임(121)에 설치될 수 있고, 최후방 위치(P2)를 향해 후퇴되던 이동부(144)는 스토퍼(500)에 후방 방향(R)으로 걸려 더 이상 후방 방향으로 후퇴되지 못할 수 있다.

[0169] 스토퍼(500)는 이동부(144)의 이동 방향으로 이동부(144)의 전방과 후방에 설치될 수 있고, 그 설치 위치에 따라 이동부(144)의 실제 이동 경로를 가변시킬 수 있다.

[0170] 이동부(144)의 이동 가능 경로는 최전방 위치(P1)와 최후방 위치(P2) 사이인데, 스토퍼(500)가 도 19과 같이, 최전방 위치(P1) 보다 후방인 위치에 이동부(144) 보다 전방에 위치되게 설치되면, 이동부(144)의 실제 이동 가능 경로는 스토퍼(500)의 후단인 위치(P3)와 최후방 위치(P2)의 사이일 수 있고, 스토퍼(500)가 도 20과 같이, 최후방 위치(P2) 보다 전방인 위치에 이동부(144) 보다 후방에 위치되게 설치되면, 이동부(144)의 실제 이동 가능 경로는 스토퍼(500)의 선단인 위치(P4)와 최전방 위치(P1)의 사이일 수 있다.

[0171] 높낮이 조절 가능한 책상은 스토퍼(500)에 의해 상판(110)의 최대 상승 높이를 스토퍼(500)가 설치되지 않는 경우 보다 낮게 제한할 수 있고, 상판(110)의 최대 하강 높이를 스토퍼(500)가 설치되지 않는 경우 보다 높게 제한할 수 있다.

[0172] 한편, 스토퍼(500)는 이동부(144)를 제한하는 것에 의해 이동부(144)가 하부 프레임(121)을 따라 미끄러지는 것을 방지할 수 있고, 높이조절기구(180)과 함께 높낮이 조절 가능한 책상 높이를 유지시키는 기능을 할 수 있다.

[0173] 스토퍼(500)는 그 설치 위치를 용이하게 변경할 수 있는 구조로 이루어지는 것이 바람직하고, 베이스(120)의 외부에서 손으로 잡기 용이한 구조로 이루어지는 것이 바람직하다.

[0174] 스토퍼(500)는 이동부(144)의 이동 경로(P1부터 P2까지)에 위치되어 이동부(144)와 접촉되고 이동부(144)를 구속하는 이동부 접촉부재(502)를 포함할 수 있다. 스토퍼(500)는 사용자가 손으로 잡고 돌일 수 있는 손잡이부재(504)를 더 포함할 수 있다. 손잡이부재(504)는 이동부 접촉부재(502)와 분리 가능하게 결합될 수 있고, 하부 프레임(121)의 외부에 위치될 수 있게 이동부 접촉부재(502)와 결합될 수 있다. 스토퍼(500)는 손잡이부재(504)와 이동부 접촉부재(502)를 연결하는 연결부재(506)을 더 포함할 수 있다. 연결부재(506)는 손잡이부재(504)와 이동부 접촉부재(502) 중 어느 하나에 돌출되게 장착되거나 일체로 돌출되게 형성될 수 있고, 이 경우 손잡이부재(504)와 이동부 접촉부재(502) 중 다른 하나에는 연결부재(506)의 적어도 일부가 내삽되는 연결부재 결합공이 형성될 수 있다. 연결부재(506)는 연결부재 결합공에 끼움되어 결합되는 것이 가능하고, 나사 결합되는 것도 가능함은 물론이다.

[0175] 연결부재(506)는 손잡이부재(504)와 이동부 접촉부재(502) 중 어느 하나에 수평 방향으로 돌출되게 배치될 수 있다.

[0176] 한편, 하부 프레임(121)에는 연결부재(506)가 관통될 수 있는 슬릿(121C)가 형성될 수 있다. 슬릿(121C)은 하부 프레임(121)에 전후 방향으로 길게 형성될 수 있고, 연결부재(506)는 슬릿(121C)의 선단(121D)과 슬릿(121C)의 후단(121E) 사이의 소정 위치에 위치될 수 있다.

[0178] 도 21은 본 발명의 제 7 실시예에 따른 높낮이 조절 가능한 책상의 후방측 사시도이고, 도 22은 본 발명의 제 7 실시예의 수평 유지부가 확대 도시된 사시도이다.

[0179] 본 실시예의 높낮이 조절 가능한 책상은 베이스(120); 상판(110)과; 베이스(120)와 상판(110) 사이에 배치되어 상판(110)을 승강 가능하게 지지하는 링크 기구(L)를 포함할 수 있고, 링크 기구(L)는 베이스(120)와 상판(110) 중 어느 하나에 힌지 연결됨과 아울러 베이스(120)와 상판(110) 중 다른 하나에 안내되어 상판(110)을 승강시키고 좌우 방향으로 이격된 좌측 링크와 우측 링크와, 상판(110)이 수평을 유지하면서 승강되도록 좌측 링크와 우측 링크가 서로 평행을 유지하면서 동작되게 연결된 수평유지부(600)를 포함할 수 있다.

[0180] 본 실시예는 수평유지부(600) 이외의 기타 구성이 본 발명 제 1 실시예 내지 제 6 실시예 중 하나와 동일하거나 유사할 수 있고, 동일한 구성에 대해서는 동일 부호를 사용하고 그에 대한 상세한 설명은 생략한다. 편의를 위해 제 5 실시예 및 제 6 실시예와 동일한 구성에 대해서는 제 5 실시예 및 제 6 실시예와 동일 도면부호를 사용하고 그에 대한 상세한 설명은 생략한다.

[0181] 좌측 링크와 우측 링크 각각은 베이스(120)와 상판(110) 중 어느 하나에 힌지 연결된 연결부재(140)와, 연결부재(140)에 회전 가능하게 연결되어 베이스(120)와 상판(110) 중 다른 하나에 안내되는 이동부(144)를 포함할 수 있다.

[0182] 본 실시예의 좌측 링크는 본 발명 제 5 실시예의 한 쌍의 제 2 링크(L2) 중 좌측에 위치하는 링크일 수 있고, 이하, 설명의 편의를 위해, 본 발명 제 5 실시예와 상이한 도면부호인 L21을 사용하여 설명한다.

[0183] 본 실시예의 우측 링크는 본 발명 제 5 실시예의 한 쌍의 제 2 링크(L2) 중 우측에 위치하는 링크일 수 있고, 이하, 설명의 편의를 위해, 본 발명 제 5 실시예와 상이한 도면부호인 L22를 사용하여 설명한다.

[0184] 수평 유지부(600)는 이동부(144)와 커플러(602)로 연결된 평행축(610)을 포함할 수 있다. 평행축(610)은 좌측 링크(L21)와 우측 링크(L22) 사이에 수평 방향으로 길게 위치될 수 있다. 평행축(610)은 좌측 링크(L21)의 하단과 우측 링크(L22)의 하단 사이의 거리 보다 짧게 형성될 수 있다. 커플러(602)는 평행축(610)의 좌측과 연결되는 좌측 커플러와, 평행축(610)의 우측과 연결되는 우측 커플러를 포함할 수 있다. 평행축(610)은 좌측 링크(L21)의 이동부(144)와, 우측 링크(L22)의 이동부(144)를 연결하는 이동부 커넥터일 수 있고, 좌측 링크(L21)의 이동부(144)와 우측 링크(L22)의 이동부(144)와 함께 회전되면서 좌측 링크(L21)의 이동부(144)와 우측 링크(L22)의 이동부(144) 중 어느 하나가 다른 하나 보다 빠르게 회전되면서 안내되는 것을 막을 수 있다.

[0185] 평행축(610)의 좌측단은 좌측 링크(L21)의 우측에 위치하는 좌측 커플러와 연결될 수 있고, 평행축(610)의 우측단은 우측 링크(L22)의 좌측에 위치하는 우측 커플러에 연결될 수 있다. 높낮이 조절 가능한 책상은 좌우 방향으로 좌측 링크(L21)와, 좌측 커플러와, 평행축(610)과, 우측 커플러와, 우측 링크(L22)의 순서일 수 있다.

[0186] 좌측 링크(L21)의 이동부(144)와 우측 링크(L22)의 이동부(144)에는 회전 축(149A)이 돌출될 수 있다.

[0187] 좌측 링크(L21)의 이동부(144)에 돌출된 회전 축(149A)은 좌측 링크(L21)의 연결부재(140)을 관통하여 좌측 커플러에 연결될 수 있고, 우측 링크(L22)의 이동부(144)에 돌출된 회전 축(149A)은 우측 링크(L22)의 연결부재(140)을 관통하여 우측 커플러에 연결될 수 있다.

[0188] 좌측 링크(L21)의 이동부(144)와 우측 링크(L22)의 이동부(144) 중 어느 하나가 회전되면, 좌측 링크(L21)의 이동부(144)와 우측 링크(L22)의 이동부(144)는 커플러(602) 및 평행축(610)에 의해 일체로 회전될 수 있고, 좌측 링크(L21)의 이동부(144)와 우측 링크(L22)의 이동부(144)는 동일 속도로 회전되게 유도될 수 있다.

[0189] 좌측 링크(L21)의 이동부(144)와 우측 링크(L22)의 이동부(144)가 서로 상이한 속도로 회전될 경우, 좌측 링크(L21)의 이동부(144)와 우측 링크(L22)의 이동부(144)는 전후 방향의 위치가 서로 상이할 수 있고, 이 경우 상판(110)은 좌우 중 일측으로 편심되게 쏠리면서 기울어질 수 있다.

[0190] 한편, 상기와 같이, 좌측 링크(L21)의 이동부(144)와 우측 링크(L22)의 이동부(144)가 평행축(610)에 의해 일체로 동일 속도로 회전되면, 상판(110)은 전체적으로 수평을 유지하면서 승강될 수 있다.

[0191] 수평유지부(600)는 좌측 링크(L21) 및 우측 링크(L22)에 각각 연결된 링크 커넥터(142)를 포함할 수 있다. 링크 커넥터(142)는 좌측 링크(L21) 및 우측 링크(L22)가 일체로 동작되게 좌측 링크(L21)의 연결부재와 우측 링크(L22)의 연결부재를 연결할 수 있다.

[0192] 수평유지부(600)는 이동부(144)와 함께 회전하도록 결합되는 피니언 기어(149B)와, 피니언 기어(149B)가 전후 방향으로 이동되게 치합된 랙 기어(121F)를 포함할 수 있다. 여기서, 상기 커플러(602) 내에는 상기 피니언 기어의 회전을 저지하는 완충부, 예를 들어 오일 등이 봉입된 완충수단 등이 구비될 수 있고, 이를 통해서 상기 이동부의 이동 또는 유동을 일정 수준 내에서 저지할 수 있게 된다. 이로 인해서, 상기 상판이 보다 안정적으로 지지될 수 있게 된다.

[0193] 랙 기어(121F)는 이동부(144)가 안내되는 베이스(120) 또는 상판(110)에 형성될 수 있다.

[0194] 랙 기어(121F)는 하부 프레임(121)에 전후 방향으로 길게 형성될 수 있고, 이동부(144)는 하부 프레임(121) 내부에 랙 기어(121F)를 따라 전후 방향으로 회전되게 위치될 수 있다. 피니언 기어(149B)와 랙 기어(121F)는 이동부(144)의 회전시 이동부(144)가 옆 방향으로 뒤틀리는 것을 막을 수 있고, 이동부(144)는 흔들림이 최소화되

면서 전후 방향으로만 진퇴될 수 있다.

[0195] 이동부(144)가 랙 기어(121F)를 따라 회전될 때, 피니언 기어(149B)와 랙 기어(121F)는 이동부(144)의 옆 방향으로 뒤틀리는 것을 방지하면서 이동부(144)가 보다 부드럽게 회전되는 것을 도울 수 있다. 상판(110)은 전체적으로 부드럽게 승강될 수 있다.

[0196] 수평유지부(600)는 링크 커넥터(142), 피니언 기어(149B) 및 랙 기어(121F) 없이, 평행축(610)가 단독으로 상판(110)의 수평을 유지시키는 것이 가능하다.

[0197] 수평유지부(600)는 링크 커넥터(142) 없이, 평행축(610), 피니언 기어(149B) 및 랙 기어(121F)의 조합으로 구성되어 상판(110)의 수평을 유지시키는 것이 가능하다. 이 경우, 상판(110)은 흔들림 없이 보다 안정적으로 수평을 유지하면서 승강 동작될 수 있다.

[0198] 수평유지부(600)는 평행축(610), 피니언 기어(149B) 및 랙 기어(121F) 없이, 링크 커넥터(142)가 단독으로 상판(110)의 수평을 유지시키는 것이 가능하다.

[0199] 수평유지부(600)는 평행축(610) 없이, 링크 커넥터(142), 피니언 기어(149B) 및 랙 기어(121F)의 조합으로 구성되어 상판(110)의 수평을 유지시키는 것이 가능하다. 이 경우, 상판(110)은 흔들림 없이 보다 안정적으로 수평을 유지하면서 승강 동작될 수 있다.

[0200] 수평유지부(600)는 평행축(610)과, 링크 커넥터(142), 링크 커넥터(142), 피니언 기어(149B) 및 랙 기어(121F)의 조합으로 구성되어 상판(110)의 수평을 유지시키는 것이 가능하다. 이 경우, 상판(110)은 가장 안정적으로 수평을 유지하면서 승강 동작될 수 있다.

[0202] 도 23은 본 발명의 제 8 실시예의 높낮이 조절 가능한 책상이 도시된 사시도이다.

[0203] 본 실시예는 베이스(120); 상판(110)과; 베이스(120)와 상판(110) 사이에 배치되어 상판(110)을 승강 가능하게 지지하는 링크 기구(L)를 포함하고, 링크 기구(L)는 베이스(120)와 상판(110) 사이에 전후 방향으로 이격되고 서로 평행하게 배치된 한 쌍의 링크(L3)(L4)를 포함한다. 본 실시예는 베이스(120)에 회전 가능하게 연결되고 한 쌍의 링크(L3)(L4) 중 하나에 피스톤 로드(182)가 연결된 높이조절기구(180)을 더 포함할 수 있다.

[0204] 본 실시예는 베이스(120)의 좌측부와 상판(110)의 좌측부 사이의 좌측 한 쌍의 링크와, 좌측 한 쌍의 링크 중 어느 하나에 피스톤 로드가 연결된 좌측 높이조절기구를 포함할 수 있다. 본 실시예는 베이스(120)의 우측부와 상판(110)의 우측부 사이의 우측 한 쌍의 링크를 포함할 수 있고, 우측 한 쌍의 링크 중 어느 하나에 피스톤 로드가 연결된 우측 높이조절기구를 포함할 수 있다.

[0205] 한 쌍의 링크(L3)(L4)와 높이조절기구(180)는 두 셋트가 베이스(120)와 상판(110) 사이에 좌우 방향으로 이격되게 배치될 수 있다.

[0206] 베이스(120)는 하부 프레임을 포함할 수 있다. 베이스(120)는 좌측 하부 프레임과 우측 하부 프레임을 포함할 수 있고, 좌측 하부 프레임과 우측 하부 프레임은 프레임 커넥터(123)으로 연결될 수 있다.

[0207] 좌측 하부 프레임과 우측 하부 프레임은 그 각각이 전후 방향으로 길게 배치될 수 있고, 서로 평행하게 배치될 수 있다. 좌측 하부 프레임과 우측 하부 프레임은 좌,우 대칭되는 구조이고, 이하 동일한 구성에 대해서는 하부 프레임으로 칭하여 설명한다.

[0208] 하부 프레임은 전후 방향으로 길게 형성된 하판부(121G)와, 한 쌍의 링크(L3)(L4) 각각이 연결된 로어 연결부(121J)와, 높이조절기구(180)이 힌지 연결된 높이조절기구 연결부(121K)를 포함할 수 있다.

[0209] 로어 연결부(121J)는 하판부(121G)의 전방부에 수직하게 절곡 형성될 수 있다. 그리고, 높이조절기구 연결부(121K는 하판부(121G)의 후방부 또는 프레임 커넥터(123)에 수직하게 절곡 형성될 수 있다.

[0210] 상판(110)는 상부 프레임을 포함할 수 있다. 상부 프레임은 상판(110) 중 탑 플레이트(111) 아래에 배치되게 설치될 수 있다. 상부 프레임은 한 쌍의 링크(L3)(L4) 각각이 연결된 어퍼 연결부(112G)를 포함할 수 있다.

[0211] 한 쌍의 링크(L3)(L4)는 하부가 로어 연결부(121J)에 서로 이격되게 연결될 수 있다. 한 쌍의 링크(L3)(L4)는 하부가 로어 연결부(121J)에 서로 상이한 힌지축을 중심으로 회전 가능하게 연결될 수 있다. 한 쌍의 링크(L3)(L4)는 상부가 어퍼 연결부(112G)에 연결될 수 있다. 한 쌍의 링크(L3)(L4)는 상부가 어퍼 연결부(112G)에 서로 상이한 힌지축을 중심으로 회전 가능하게 연결될 수 있다.

[0212] 한 쌍의 링크(L3)(L4)는 상판(110)의 승강시 상판(110)을 따라 동일한 기울기로 회전되면서 상판(110)을 안내할

수 있다.

[0213] 높이조절기구(180)은 하부가 높이조절기구 연결부(121K)에 힌지 연결될 수 있고, 피스톤 로드(182)가 한 쌍의 링크(L3)(L4) 중 하나에 힌지 연결될 수 있다. 높이조절기구(180)는 상판(110)의 상승시 대략 전방 상측을 향하는 방향으로 경사지게 배치되면서 피스톤 로드(182)가 한 쌍의 링크(L3)(L4) 중 하나를 향하는 방향으로 전진될 수 있다.

[0214] 높이조절기구(180)은 상판(110)의 하강시 피스톤 로드(182)가 대략 수평한 방향으로 배치되면서 피스톤 로드(182)가 높이조절기구(180)의 내부로 삽입되는 방향으로 후퇴될 수 있다.

[0215] 본 실시예는 본 발명 제 5 실시예와 같이, 조작 레버(295)의 조작시 높이조절기구(180)이 작동되면서 상판(110)의 위치를 유지시킬 수 있다.

[0217] 도 24은 본 발명의 제 9 실시예의 높낮이 조절 가능한 책상이 도시된 사시도이다.

[0218] 본 실시예는 본 발명 제 8 실시예와 링크 기구(L)가 동일할 수 있고, 높이조절기구(189)이 상판(110)에 회전 가능하게 연결됨과 아울러 한 쌍의 링크(L3)(L4) 중 하나에 피스톤 로드(182)가 연결되며, 높이조절기구(180)의 연결 대상 이외의 기타 구성 및 작용은 본 발명 제 8 실시예와 동일하거나 유사하므로 동일 부호를 사용하고 그에 대한 상세한 설명은 생략한다.

[0219] 본 실시예는 높이조절기구(180)이 힌지 연결되는 구조가 상판(110)에 구비될 수 있다. 상판(110)에는 높이조절기구(180)이 힌지 연결되는 높이조절기구 연결부(112K)가 설치될 수 있다.

[0220] 높이조절기구(180)은 상판(110)의 상승시 대략 후방 하측을 향하는 방향으로 경사지게 배치되면서 피스톤 로드(182)가 한 쌍의 링크(L3)(L4) 중 하나를 향하는 방향으로 돌출될 수 있다.

[0221] 높이조절기구(180)은 상판(110)의 하강시 피스톤 로드(182)가 대략 수평한 방향으로 배치되면서 피스톤 로드(182)가 높이조절기구(180)의 내부로 삽입되는 방향으로 이동될 수 있다.

[0222] 본 실시예는 본 발명 제 5 실시예와 같이, 조작 레버(295)의 조작시 높이조절기구(180)이 작동되면서 상판(110)의 위치를 유지시킬 수 있다.

[0223]

[0224] 도 25은 본 발명의 제 10 실시예의 높낮이 조절 가능한 책상이 도시된 사시도이다.

[0225] 본 실시예는 본 발명 제 8 실시예와 링크 기구(L)가 동일할 수 있고, 높이조절기구(189)이 높이조절기구(180)이 한 쌍의 링크(L3)(L4) 중 어느 하나에 회전 가능하게 연결되고, 한 쌍의 링크(L3)(L4) 중 다른 하나에 피스톤 로드(182)가 연결되며, 높이조절기구(180)의 연결 대상 이외의 기타 구성 및 작용은 본 발명 제 8 실시예와 동일하거나 유사하므로 동일 부호를 사용하고 그에 대한 상세한 설명은 생략한다.

[0226] 높이조절기구(180)은 한 쌍의 링크(L3)(L4) 중 어느 하나에 힌지 연결될 수 있고, 피스톤 로드(182)가 한 쌍의 링크(L3)(L4) 중 다른 하나에 힌지 연결될 수 있다.

[0227] 높이조절기구(180)은 상판(110)의 상승시 한 쌍의 링크(L3)(L4) 중 어느 하나와 함께 상승되면서 대략 상측을 향하는 방향으로 길게 배치될 수 있고, 이때 피스톤 로드(182)가 한 쌍의 링크(L3)(L4) 중 다른 하나를 향하는 방향으로 전진될 수 있다.

[0228] 높이조절기구(180)은 상판(110)의 하강시 한 쌍의 링크(L3)(L4) 중 어느 하나와 함께 대략 수평한 방향으로 배치되면서 피스톤 로드(182)가 높이조절기구(180)의 내부로 삽입되는 방향으로 후퇴될 수 있다.

[0229] 본 실시예는 본 발명 제 5 실시예와 같이, 조작 레버(295)의 조작시 높이조절기구(180)이 작동되면서 상판(110)의 위치를 유지시킬 수 있다.

[0230]

[0231] 도 26은 본 발명의 제 11 실시예의 높낮이 조절 가능한 책상이 도시된 사시도이다.

[0232] 본 실시예의 높낮이 조절 가능한 책상은 베이스(120)을 지지하는 고정다리(200)를 더 포함할 수 있다. 베이스(120)는 고정다리(200) 상측에 올려지게 설치될 수 있고, 고정다리(200)에 고정될 수 있다. 여기서, 상기 베이스를 생략하고 링크 기구가 고정다리에 직접 연결되는 예도 고려할 수 있다.

[0233] 베이스(120)는 고정다리(200)에 의해 지면으로부터 이격되게 위치될 수 있다. 베이스(120)는 고정다리(200)에 스크류 등의 체결부재나 후크 등의 걸이부에 의해 고정될 수 있다.

[0234] 고정다리(200)는 높이 조절 가능한 책상의 일부 구성이 될 수 있고, 하부 프레임 또는 레그로 기능할 수 있다. 본 실시예는 고정 다리(200)가 베이스(120), 상판(110) 및 링크기구(L)와 함께 높낮이 조절 가능한 책상을 구성할 수 있고, 이 경우 높낮이 조절 가능한 책상은 일종의 테이블 책상이 될 수 있다.

[0235] 여기서, 상기 도 19 및 20에 개시된 스토퍼 구조를 상기 도 26에 개시된 실시예에 적용하는 예도 고려할 수 있다.

[0236]

[0237] 도 27은 본 발명의 제 12 실시예의 높낮이 조절 가능한 책상의 상판이 상승되었을 때의 사시도이고, 도 28은 본 발명의 제 12 실시예의 높낮이 조절 가능한 책상의 상판이 하강되었을 때의 사시도이다.

[0238] 본 실시예의 높낮이 조절 가능한 책상(100)은 식탁으로 사용될 수 있다. 높낮이 조절 가능한 책상(100)은 상판(110)에 하측에 설치되어 링크 기구(L)의 좌측을 덮는 좌측 안전 커버(710)와 상판(110)의 하측에 링크 기구(L)의 우측을 덮는 우측 안전 커버(720)을 더 포함할 수 있다.

[0239] 좌측 안전 커버(710) 및 우측 안전 커버(720) 각각은 그 상단이 상판(110)에 스크류 등의 체결부재나 후크 등의 걸이부에 의해 고정될 수 있다.

[0240] 좌측 안전 커버(710) 및 우측 안전 커버(720) 각각의 높이는 링크기구(L)가 최대로 펼쳐졌을 때의 링크기구(L) 높이 보다 높게 형성될 수 있다. 좌측 안전 커버(710) 및 우측 안전 커버(720) 각각은 베이스(120)와 고정다리(200)의 경계 옆을 덮는 높이로 형성될 수 있다.

[0241] 좌측 안전 커버(710) 및 우측 안전 커버(720)는 상판(110)의 하강시, 상판(110)과 함께 하강될 수 있다.

[0242] 좌측 안전 커버(710)는 유아 등의 사용자 손이 좌측 안전 커버(710) 좌측에서 한 쌍의 링크 사이로 진입되지 않게 막을 수 있고, 우측 안전 커버(720)는 유아 등의 사용자 손이 우측 안전 커버(720) 우측에서 한 쌍의 링크 사이로 진입되지 않게 막을 수 있으며, 높낮이 조절 가능한 책상(100)의 안전성은 향상될 수 있다.

[0243] 본 실시예는 베이스(120), 상판(110), 링크기구(L) 등의 기타 구성 및 작용이 본 발명 제 5 실시예 내지 제 10 실시예 중 어느 하나와 동일하거나 유사하므로 동일 부호를 사용하고 그에 대한 상세한 설명은 생략한다.

[0245] 도 29는 본 발명의 제 13 실시예의 높낮이 조절 가능한 책상이 도시된 사시도이고, 도 30은 본 발명의 제 13 실시예의 높낮이 조절 가능한 책상이 도시된 측면도이다.

[0246] 높낮이 조절 가능한 책상(100)은 고정 다리(200)와; 고정 다리(200) 상측에 배치된 베이스(120); 베이스(120)와 이격된 상판(110)과; 베이스(120) 및 상판(110)에 연결되어 상판(110)을 승강 가능하게 지지하는 링크 기구(L)를 포함할 수 있고, 상판(110)은 탑 플레이트(111)와; 탑 플레이트(111) 상측에 배치되고 탑 플레이트(111) 보다 크기가 작은 보조 받침대(113')를 포함할 수 있다.

[0247] 보조 받침대(113')는 복수개의 수직판(113A)과, 복수개의 수직판(113A) 상측에 탑 플레이트(111)와 나란하게 배치된 수평판(113B)을 포함할 수 있다.

[0248] 사용자는 보조 받침대(130') 상측에 모니터(M)나 각종 책 등을 올려 놓을 수 있고, 사용자는 가장 이상적인 각도, 예를 들면 목이 편안한 각도로 모니터를 바라볼 수 있게 상판(110)의 높이를 조절할 수 있다.

[0249] 도 30을 참조하면, 사용자의 눈(E)부터 모니터(M)의 중앙으로의 하향 경사진 각도는 눈(E) 아래 방향으로 20도 내지 30도 가 적정할 수 있고, 사용자는 상판(110) 높이를 조절하는 것에 의해 모니터(M) 높이를 조절할 수 있고, 사용자가 앉는 의자 높이만을 조절할 때 보다, 눈(E)이 모니터(M)를 주시하는 각도(X)를 보다 다양하게 가변할 수 있다.

[0250] 한편, 상기 도 29 및 도 30에 도시된 제13 실시예에서 상기 탑 플레이트(111)와 보조 받침대(113')는 반드시 도시된 형태로 국한되는 것은 아니며 임의의 형태를 갖도록 할 수 있다. 도 31은 상기 제13 실시예에서의 탑 플레이트 및 보조 받침대를 도 16에 도시된 실시예의 것으로 대체한 형태를 도시한 것이다. 따라서, 도 31에 도시된 예는 기본적으로 상기 탑 플레이트 및 보조 받침대를 제외한 나머지 구성요소는 상기 제13 실시예의 것과 동일하다.

[0251] 도시된 바와 같이, 상기 탑 플레이트는 전면측에 오목부(113A)가 형성된다. 상기 오목부(113A)는 사용자의 배 부분과 대향하는 부분으로서, 이로 인해서 사용자는 모니터 등이 거치될 수 있는 보조 받침대에 보다 가깝게 접근할 수 있게 된다. 아울러, 상기 탑 플레이트의 양측에는 날개부(113B)가 배치된다. 상기 날개부(113B)는 상기 탑 플레이트에 의해 제공되는 수납 공간을 좌우로 확장시키며, 탑 플레이트와는 소정 간격을 두고 이격되도록 배치된다.

[0252] 상기 간격은 링크 기구 또는 프레임 등이 통과할 수 있는 공간을 제공하여, 상기 책상의 최소 높이를 더욱 작게 할 수 있다.

[0253] 상기 보조 받침대는 평면도 상으로 대략 'ㄷ'자 형태를 갖는다. 이로 인해서, 상기 보조 받침대의 양측 단부(111A)는 상기 탑 플레이트의 전면부를 향하여 돌출된 형태를 갖게 되고, 상기 돌출된 부분은 상기 탑 플레이트와 날개부 사이의 간극을 덮어 보다 미려한 외관을 갖도록 할 뿐만 아니라 보조 받침대의 수납 공간을 확장시키는 역할도 겸하게 된다.

[0255] 이상 제 1 실시예 내지 제 13 실시예의 따른 높낮이 조절 가능한 책상에 대하여 설명하였지만 당업자는 상기 제 1 실시예 내지 제 13 실시예를 적절하게 조합할 수 있으며, 이러한 조합도 본 발명의 보호범위에 속한다.

부호의 설명

[0256] 110: 상판 112: 상부 프레임

120: 베이스 121: 하부 프레임

130,140: 연결부재 130A, 140A: 틈 형성부

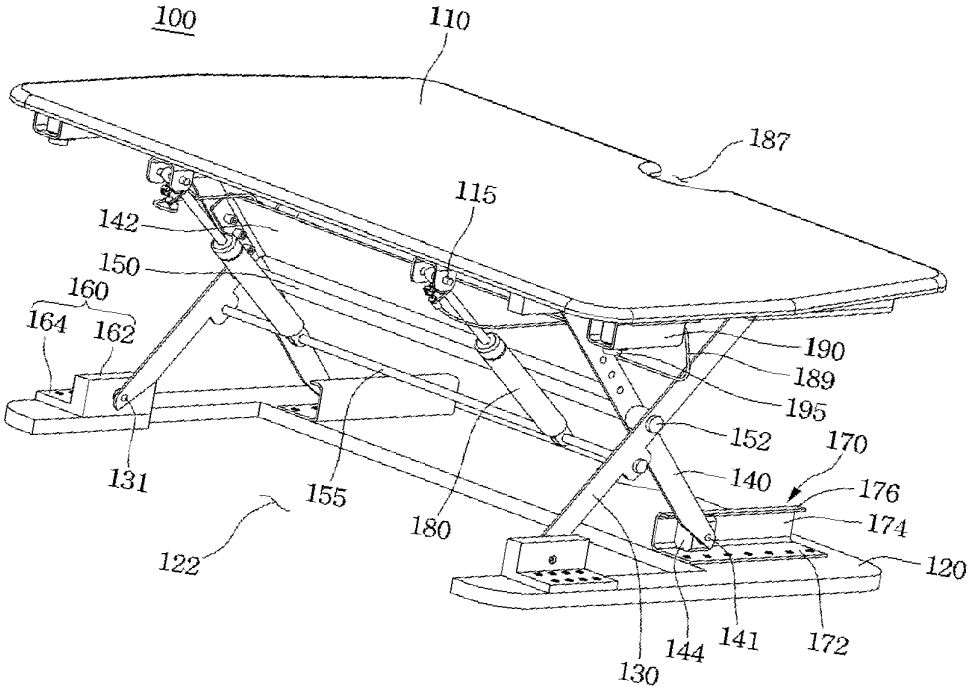
130B, 140B: 제 1 링크부 130C,140C: 제 2 링크부

144: 이동부 169: 이동부

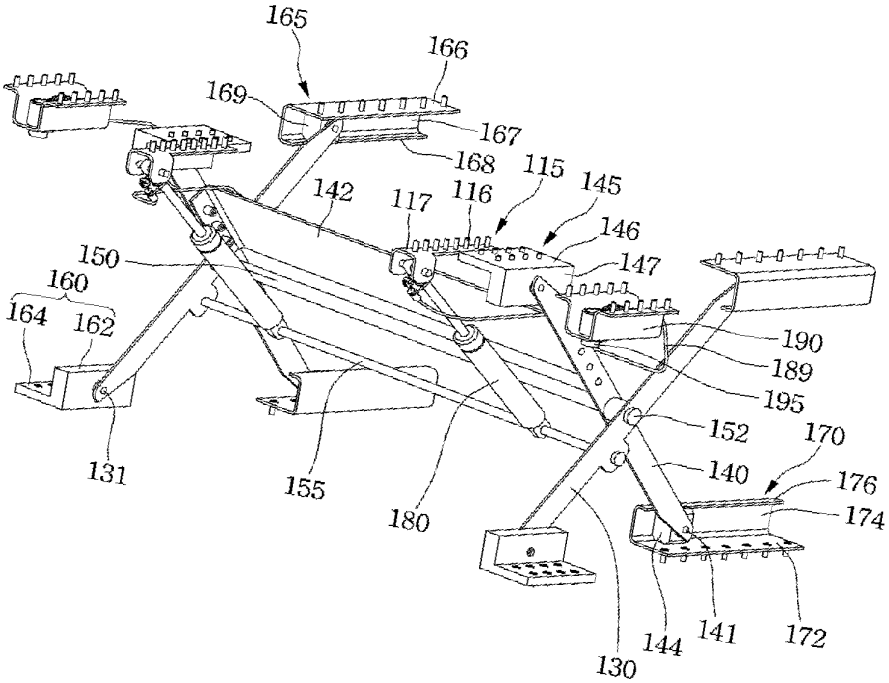
180: 높이조절기구 182: 피스톤 로드

295: 조작 레버 500: 스토퍼

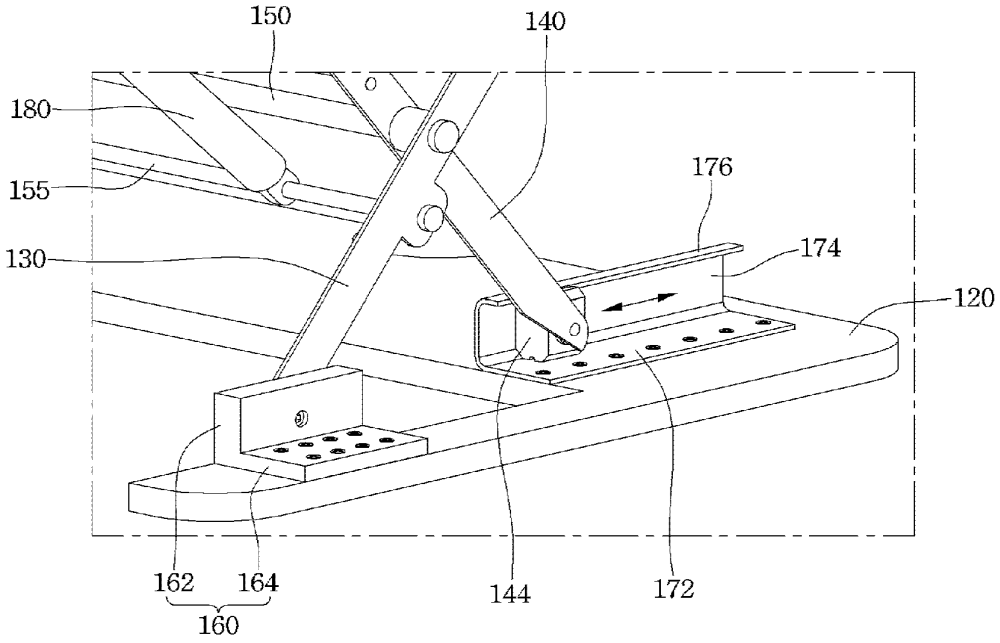
L: 링크 기구 L1,L2: 링크


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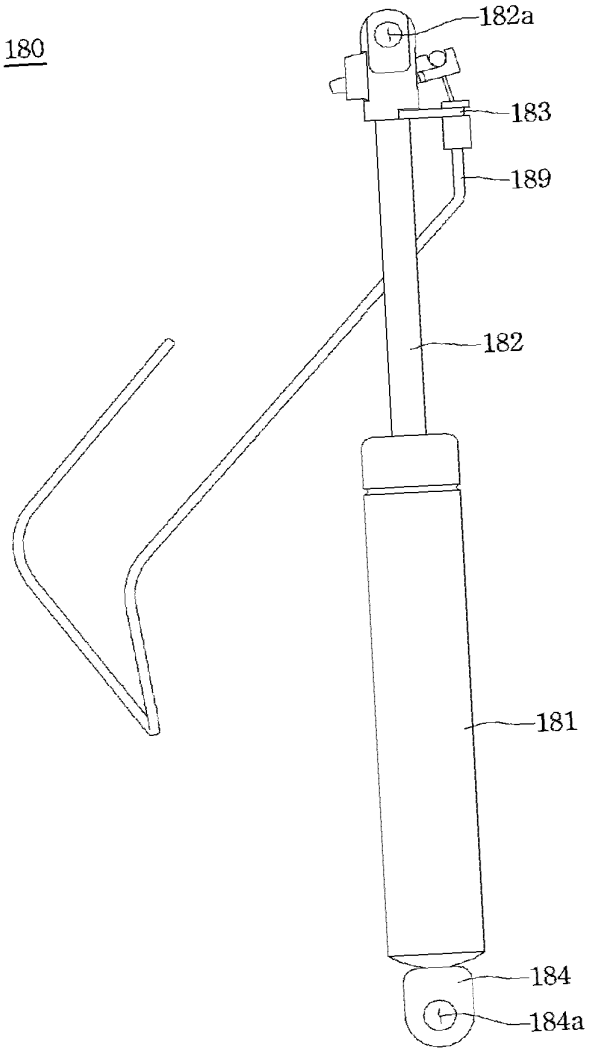
도면2


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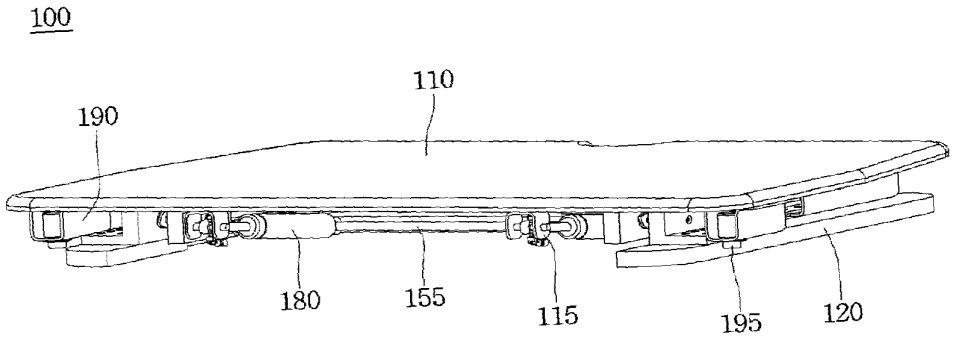
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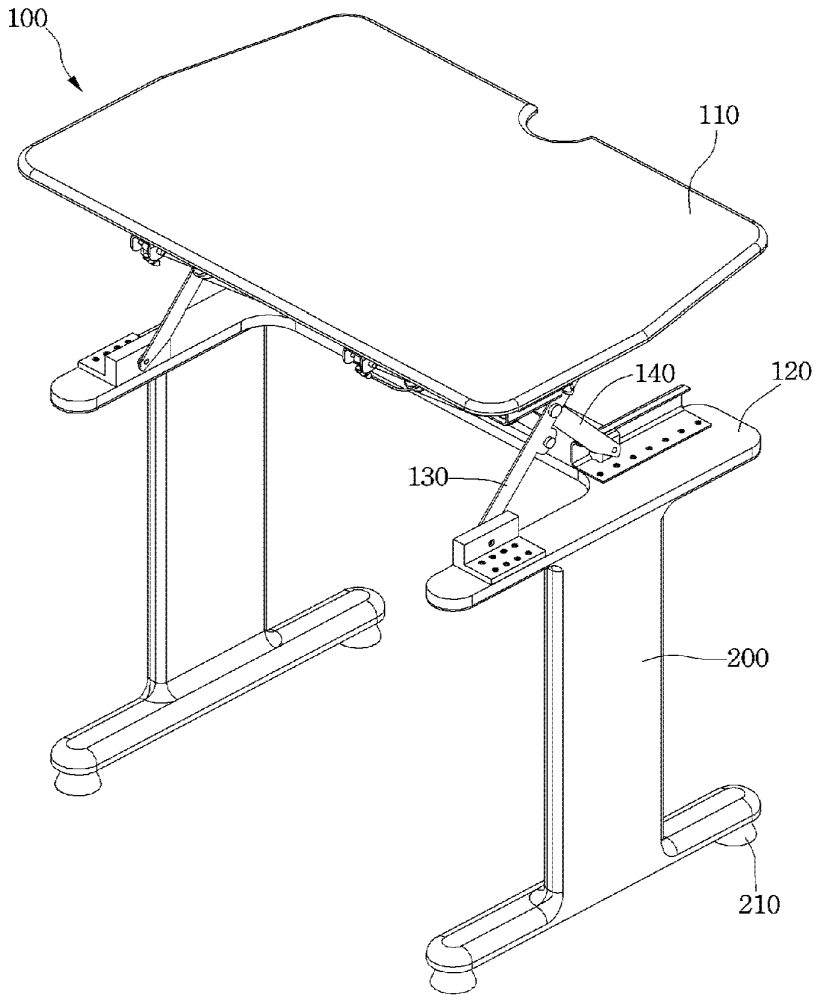
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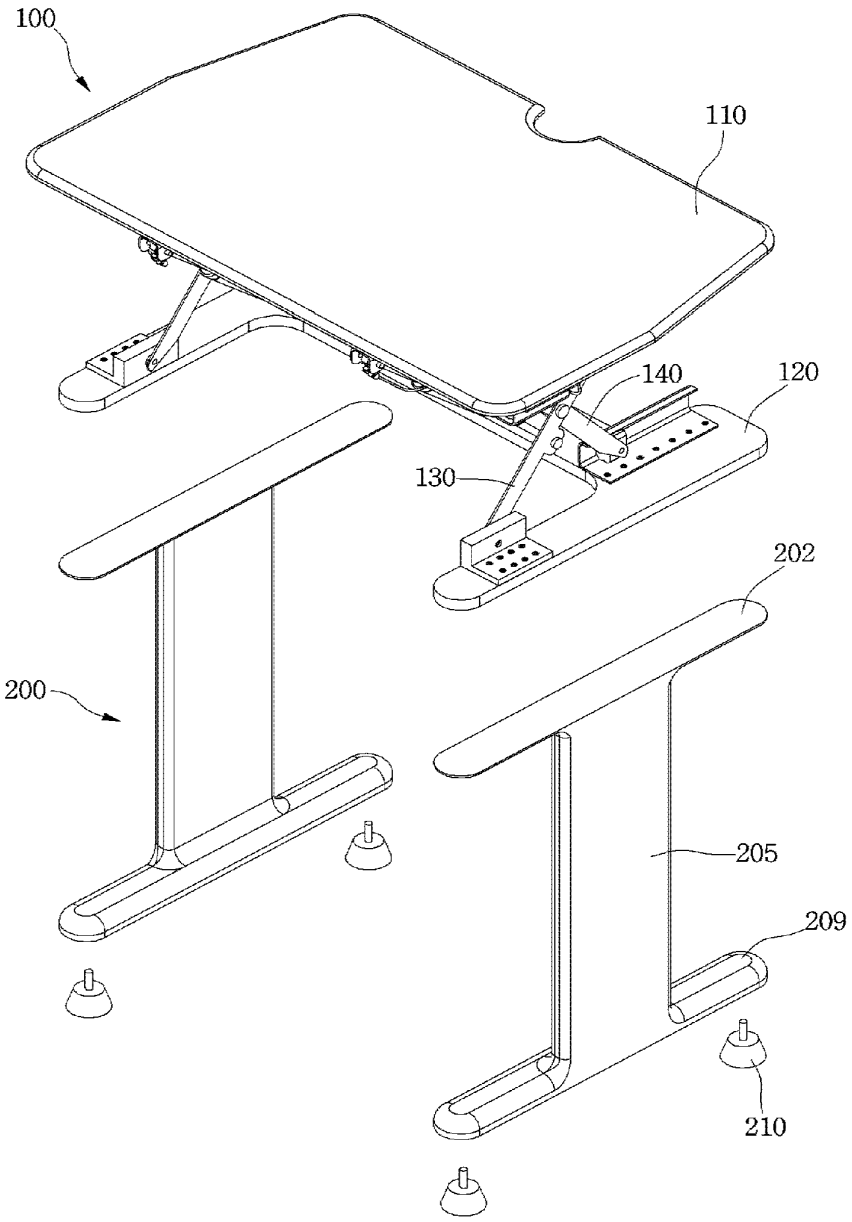
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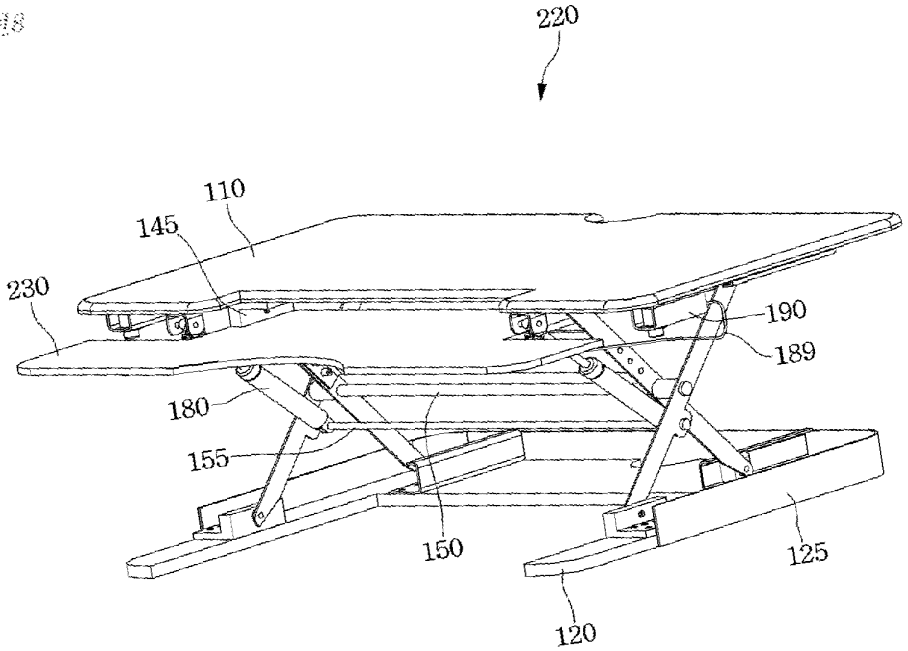
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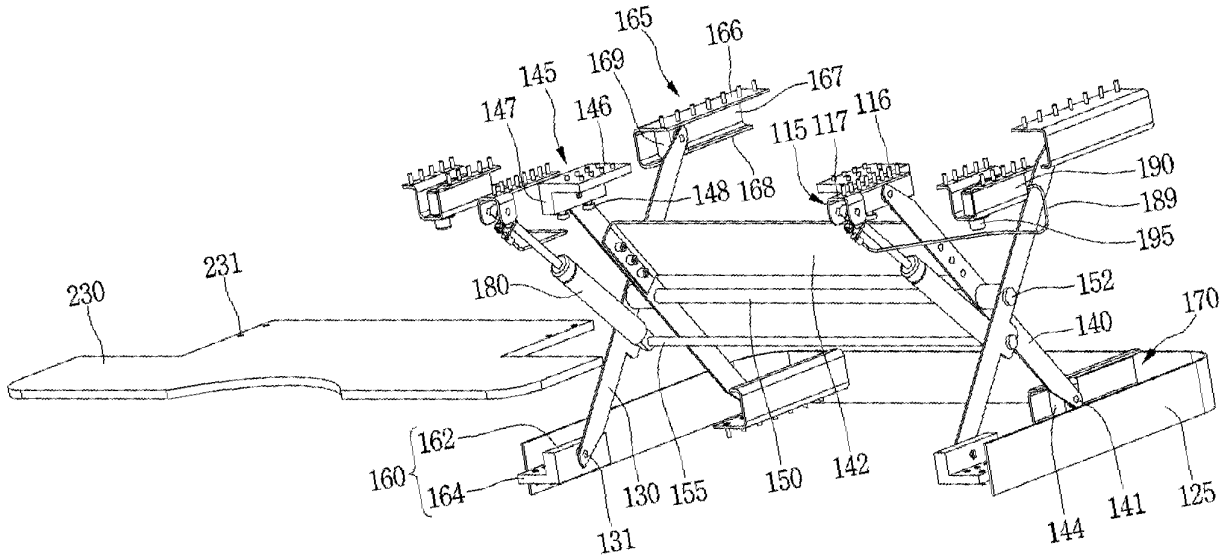


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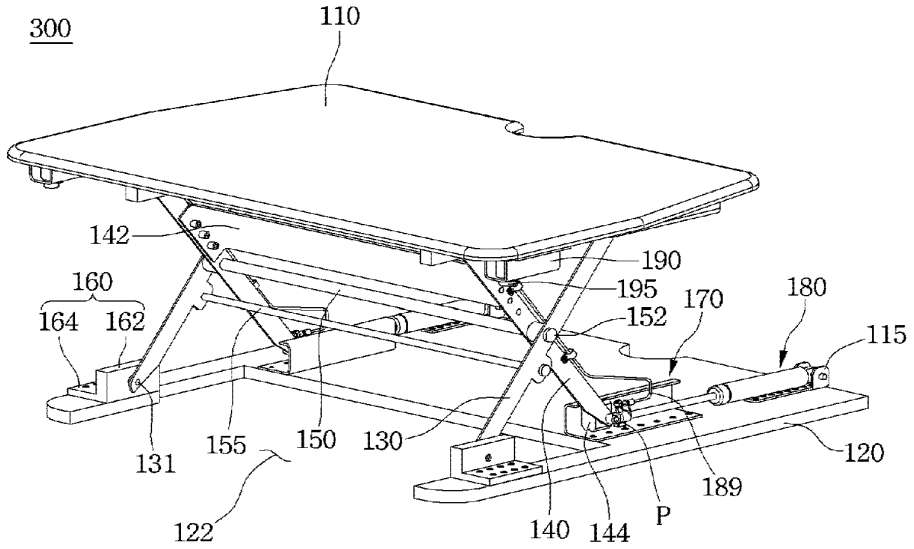


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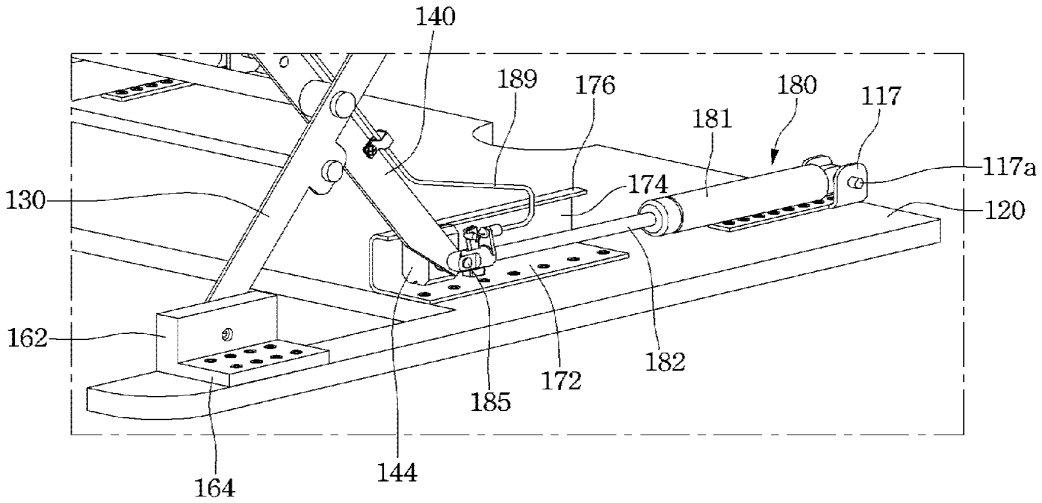



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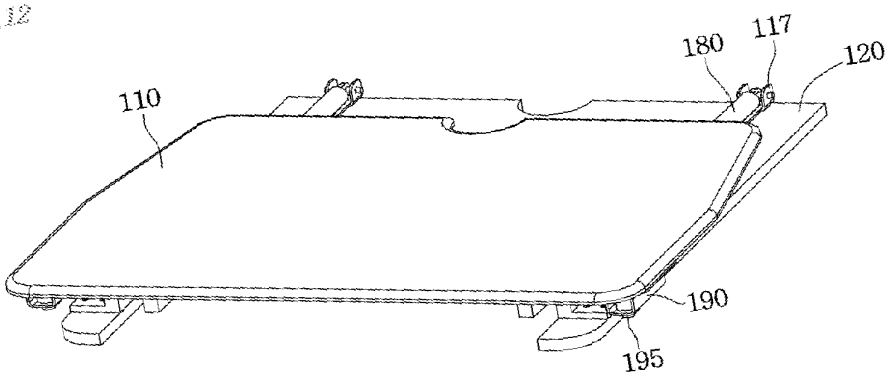
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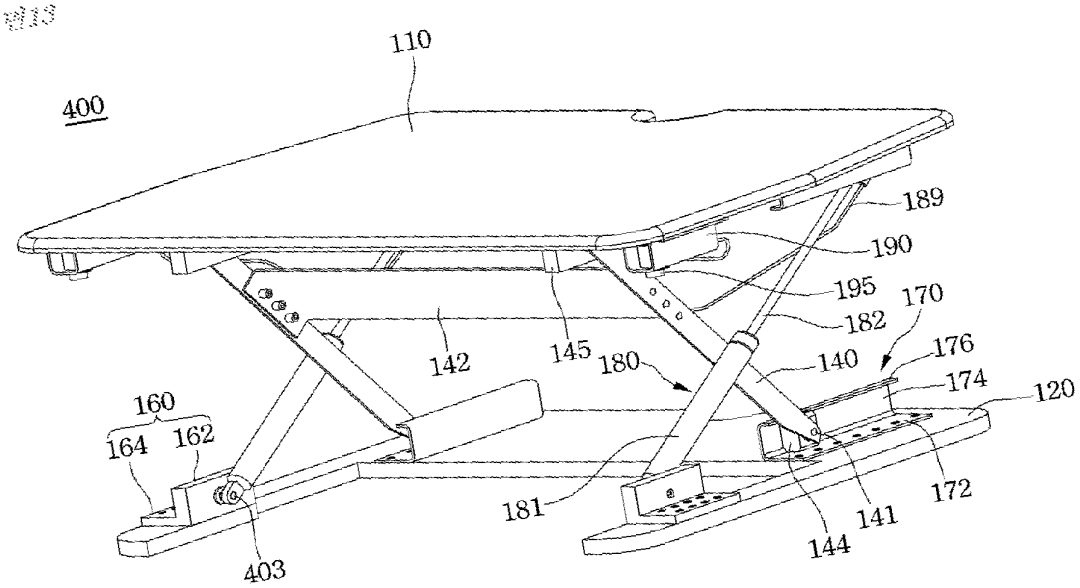
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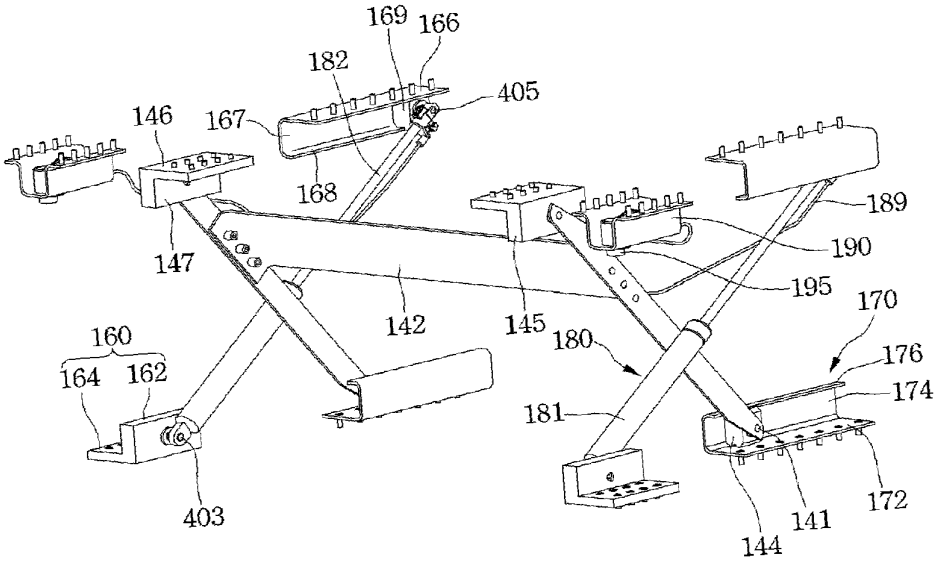
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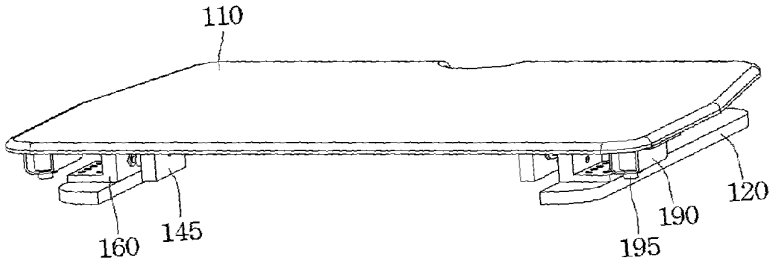
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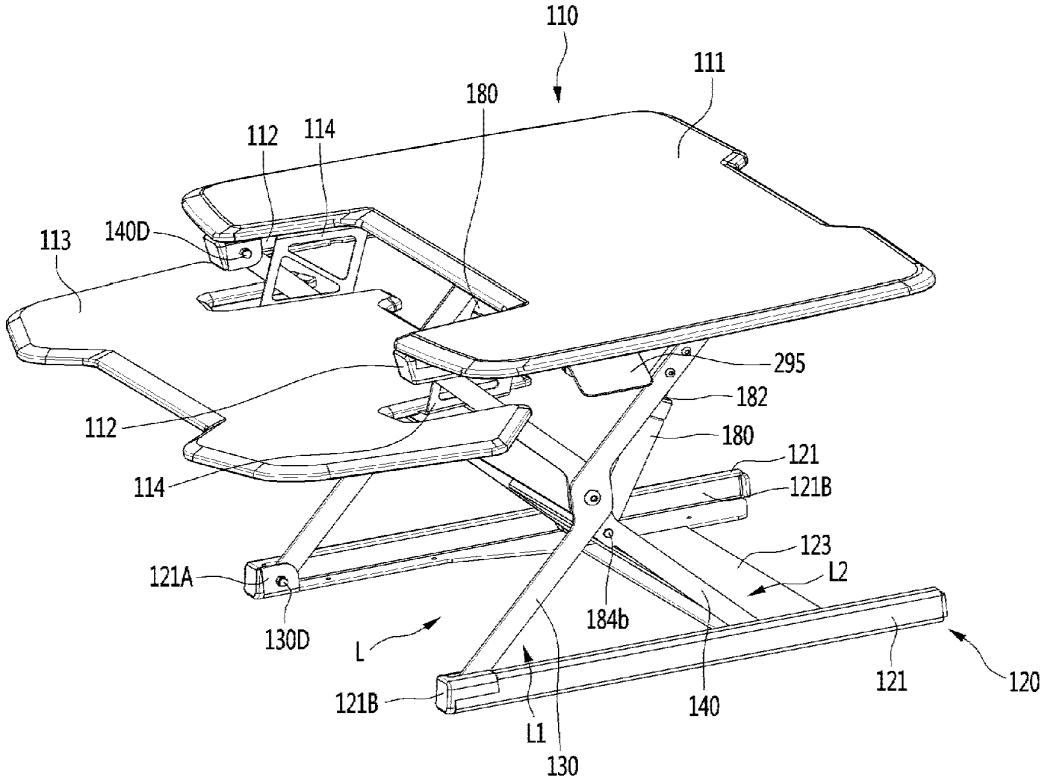
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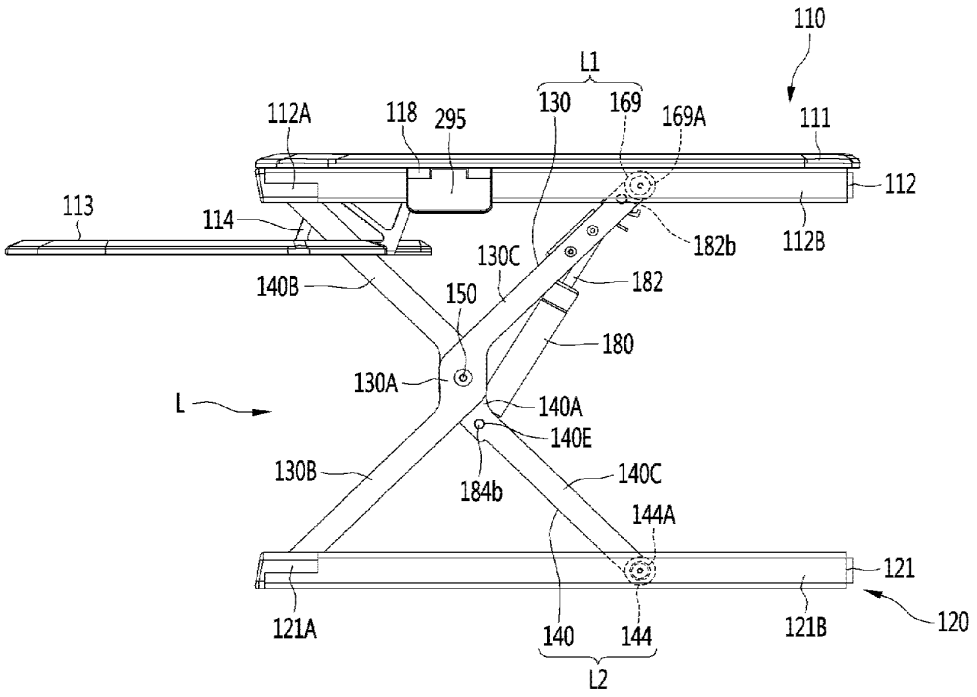
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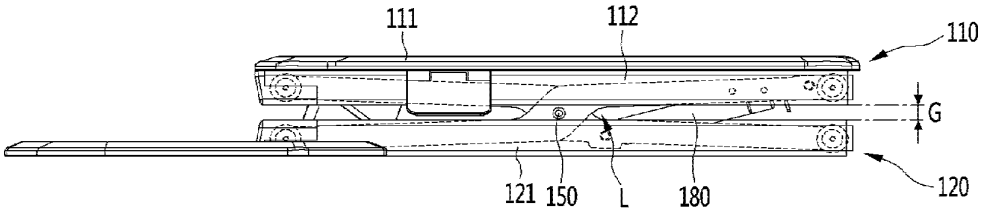
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110
111
180
112
114
113
140D
295
182
112
180
121
114
121B
123
121A
L2
184b
130D
L
121
120
121B
140
L1
130

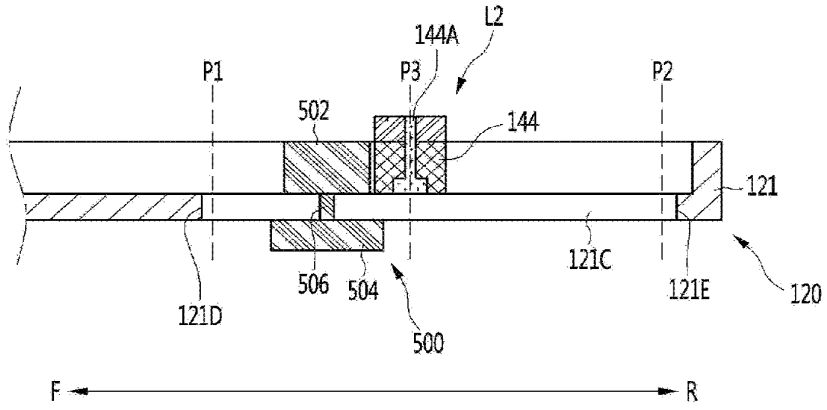
도면17


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L1
112A
118
295
130
169
169A
111
112
113
114
182b
112B
130C
140B
150
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121B
120
L2

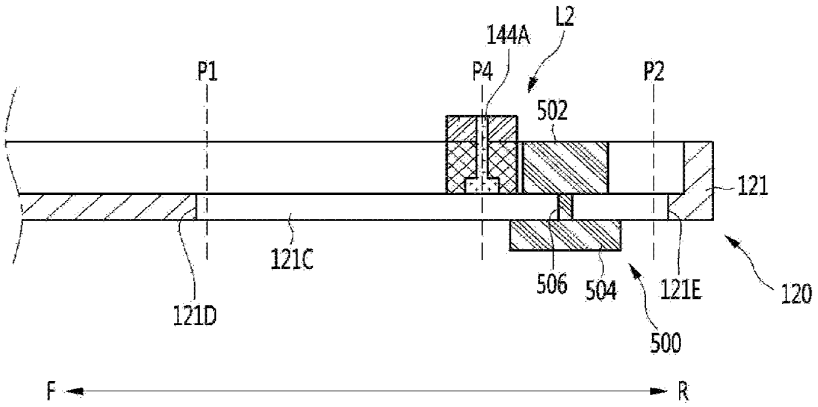
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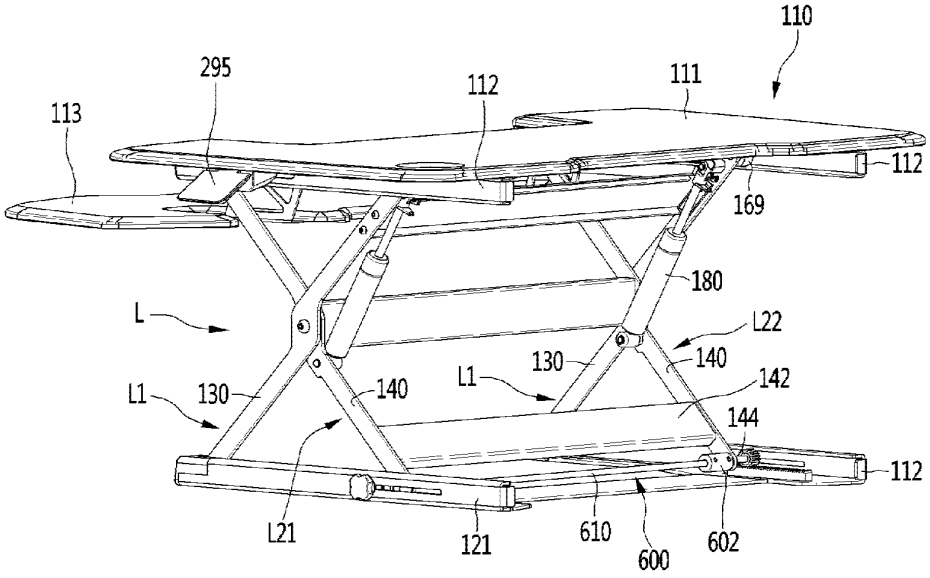
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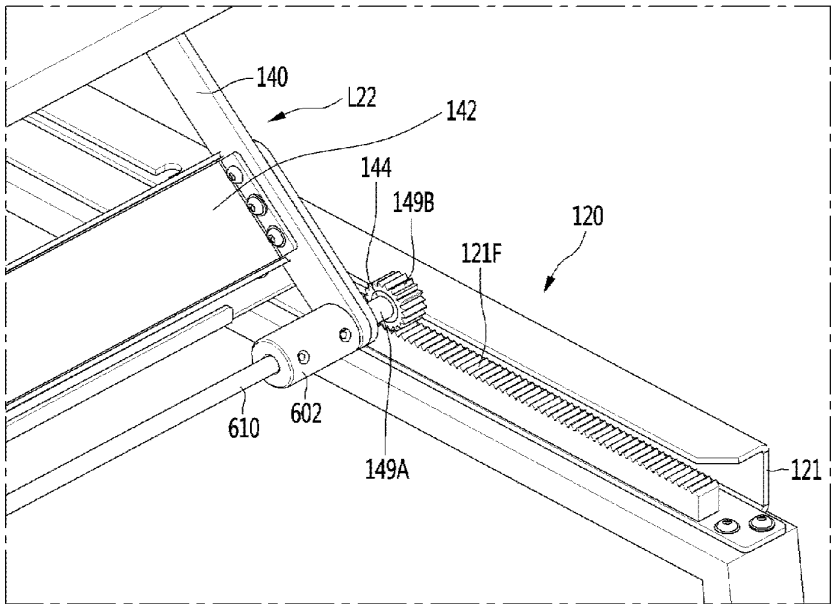
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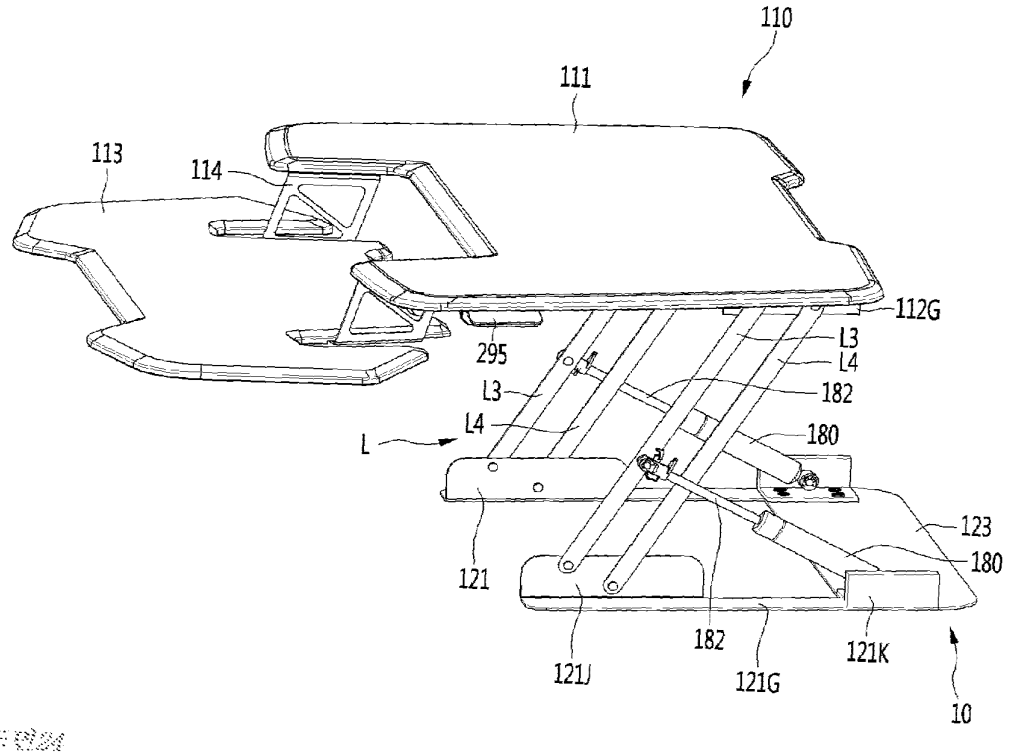
도면21


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112
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144
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L21
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610
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602

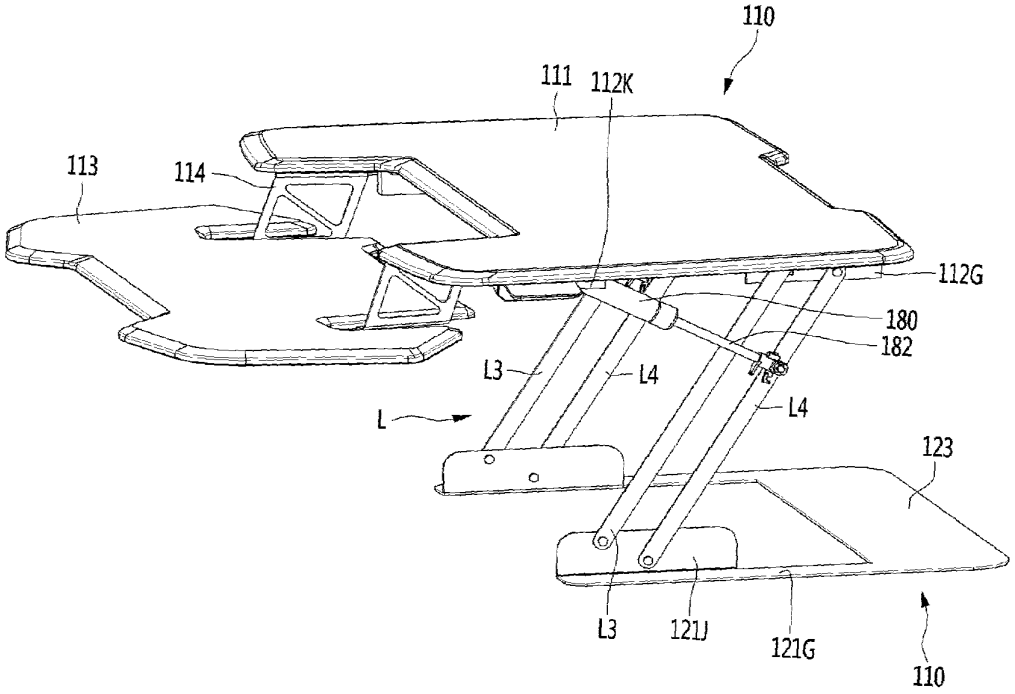
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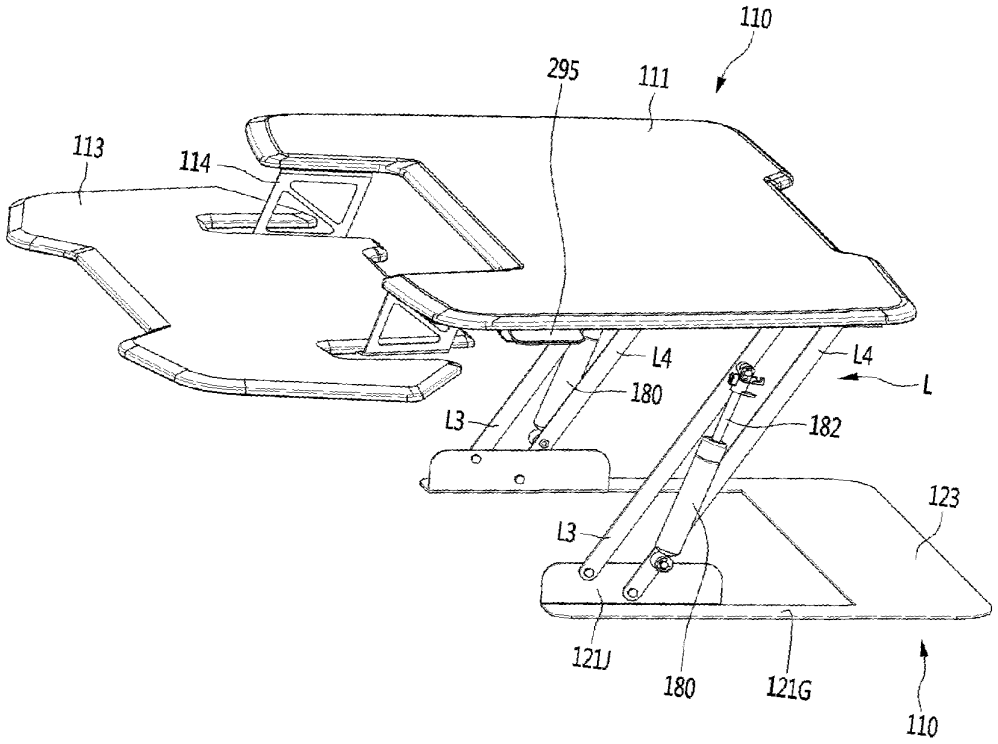

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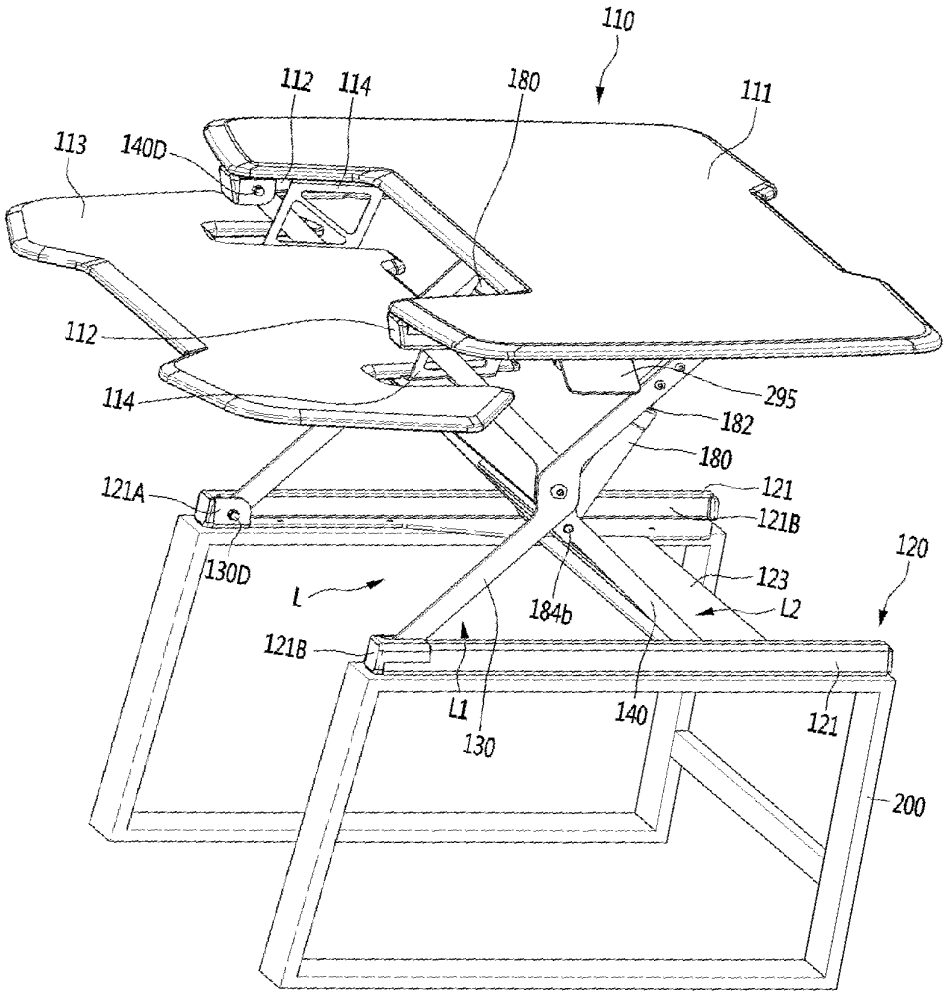
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L
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121
121J
121G
121K
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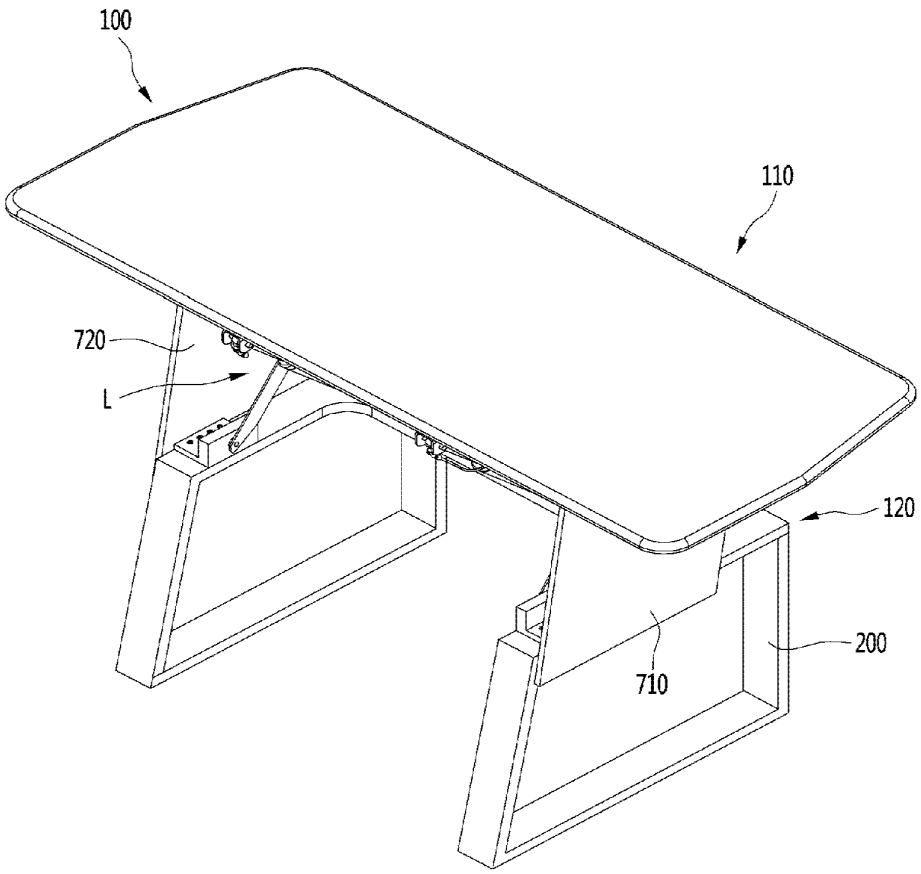
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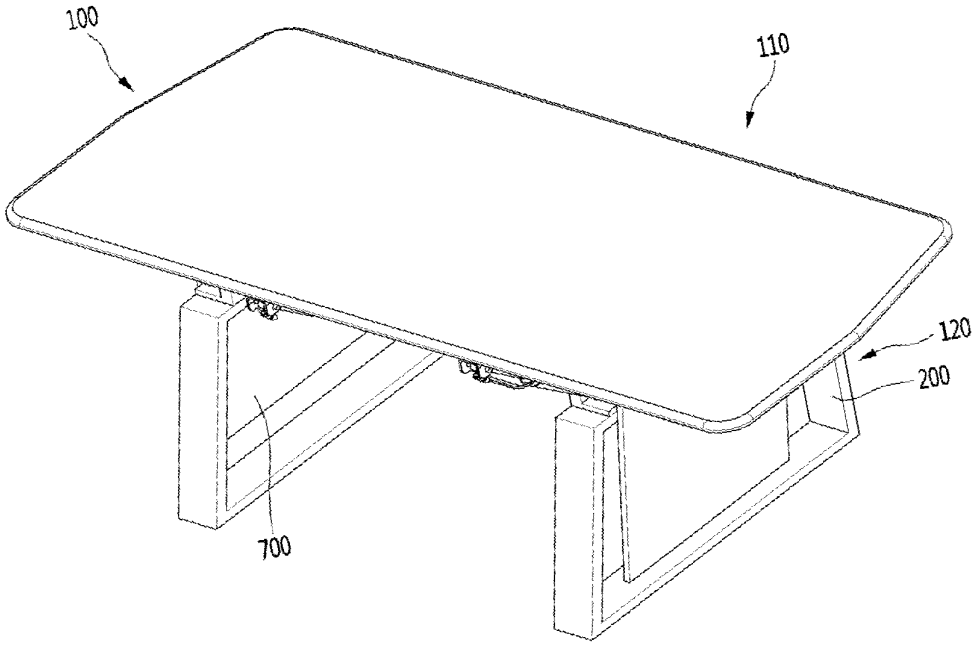

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114
L4
L4
L
180
182
L3
123
L3
121J
180
121G
110


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114
180
111
113
140D
112
114
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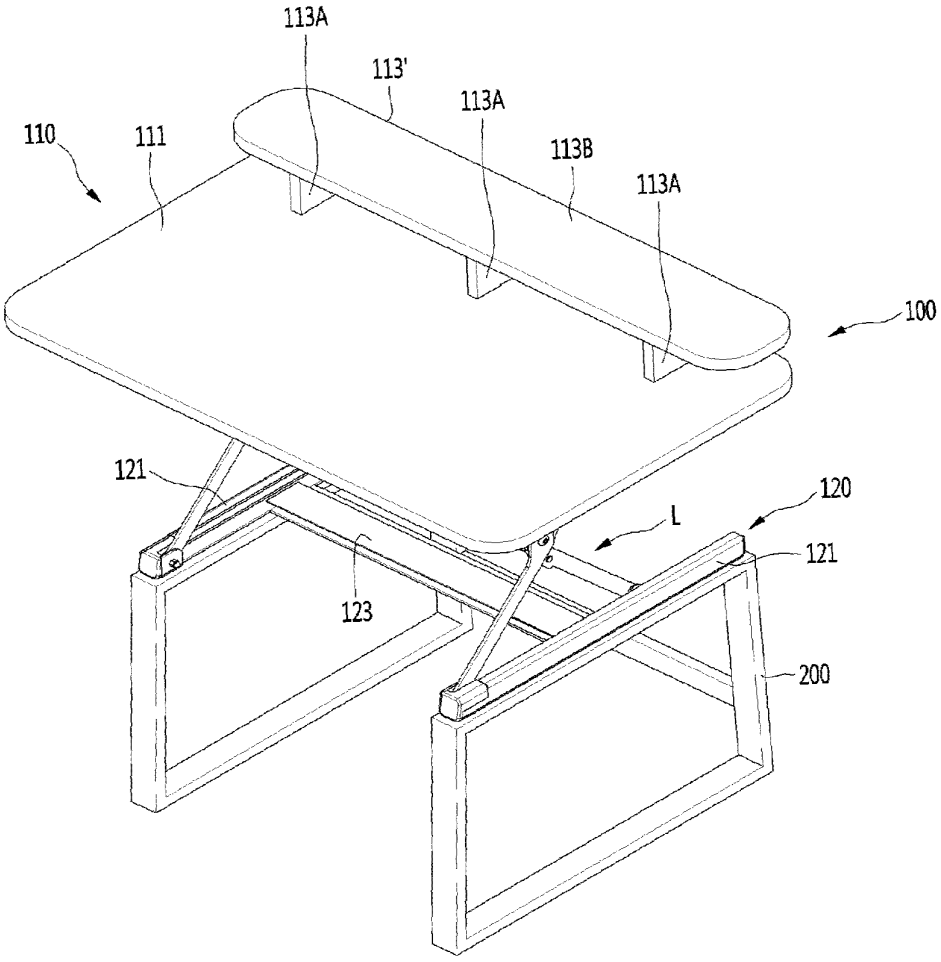
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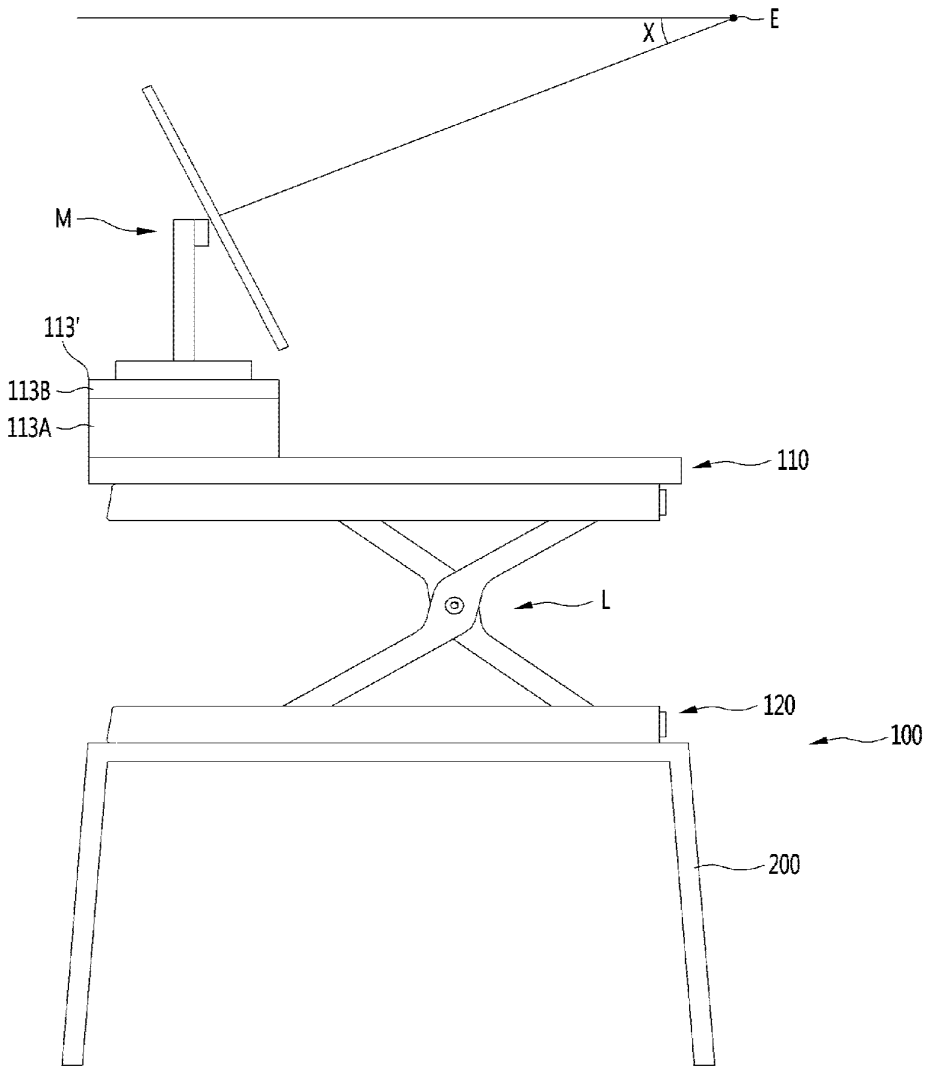
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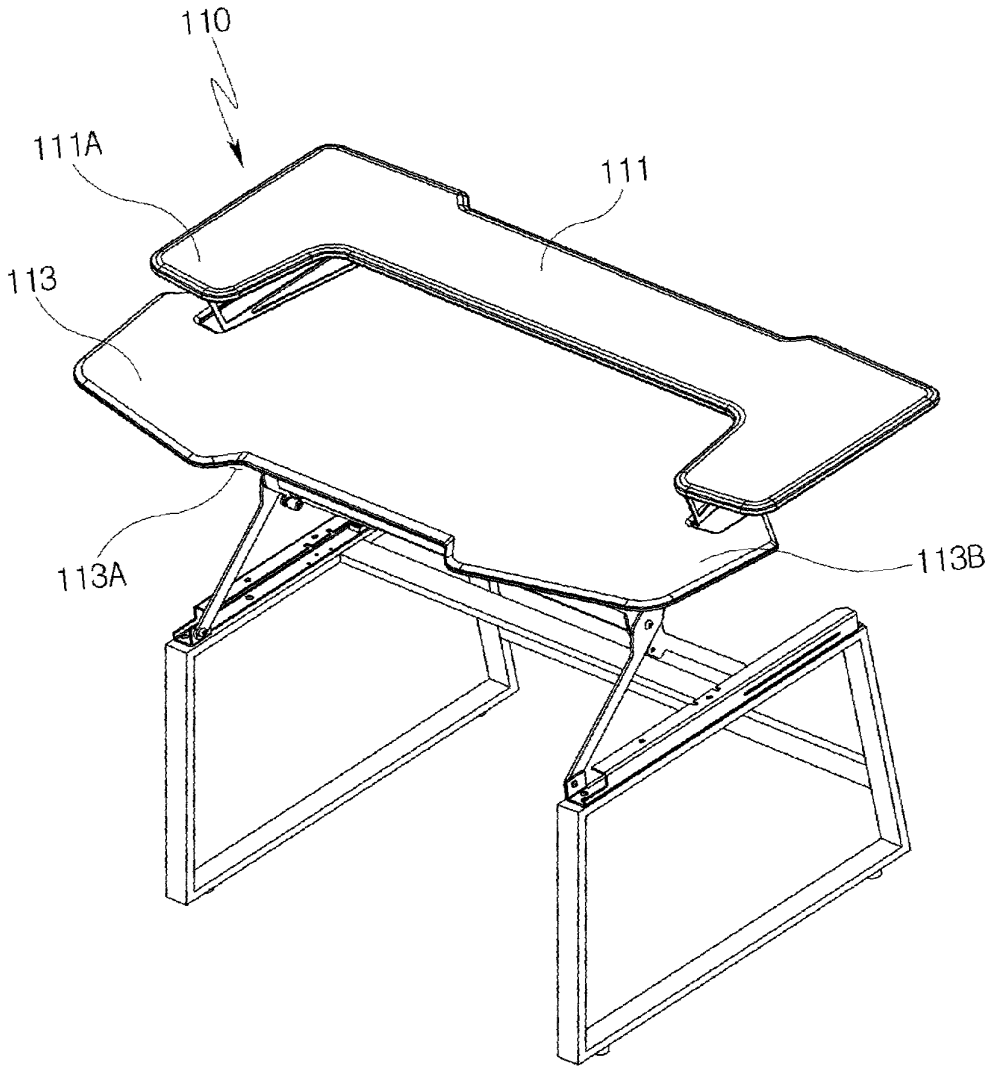
도면39



도면30



도면31



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【직권보정 1】

【보정항목】 청구범위

【보정세부항목】 청구항 8의 2줄

【변경전】

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【변경후】

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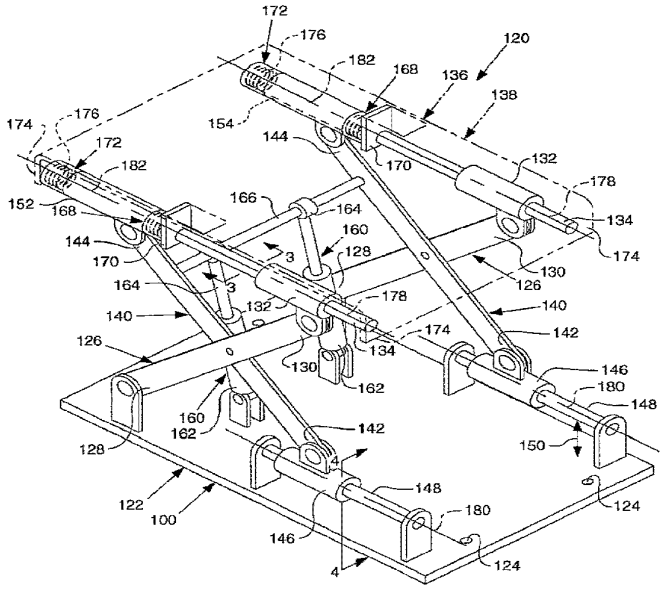
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(54) Title: SCISSOR SUSPENSION



(57) Abstract: A scissor suspension (120) includes a first arm (126) having a first end (128) and a second end (130). The first end (128) may be configured for pivotal attachment to a structure and a first bearing (132) may be pivotally connected proximate to the second end (130) of the first arm (126). A second arm (140) having a first end (142) and a second end (144) may be pivotally connected to the first arm (126) between the first and second ends (128, 142, 130, 144) of the first and second arms (126, 140). The first bearing (132) may be moveably coupled to the first rail (134).

WO 2008/002373 A2

Description

SCISSOR SUSPENSION

Technical Field

This invention relates generally to a scissor suspension for reducing vibrations transmitted through the scissor suspension.

Background

Machines, such as skid steer loaders, multi-terrain loaders, backhoe loaders, agricultural tractors, track-type tractors, articulated trucks, wheel loaders, off-road vehicles, dump trucks, and other types of construction, mining, and agricultural machinery are used for a variety of tasks requiring operator control. Typically, an operator controls these machines while seated in a seat located on the machine for extended periods of time. However, these machines often vibrate during operation, which may cause the operator may fatigue quickly reducing the effectiveness of the operator and the time the operator is able to actively operate the machine.

Consequently, suspensions have been developed to reduce the vibrations passed from the operating machine to the seat of the operator. For example, U.S. Patent No. 5,251,864 illustrates a scissor suspension that uses rollers to provide low frictional movement of the suspension in response to the vibration of a machine. Roller-type scissor suspensions also permit dampers to be installed to provide fore-aft dampening.

However, a roller may only have one point of contact while moving in a track. Consequently, roller-type scissor suspensions are loosely assembled. A loosely assembled suspension permits specific parts to receive

jarring impacts during machine operation. Thus, roller-type scissor suspensions suffer from excessive wear and premature failure.

The inherent looseness of roller-type scissor suspensions may prevent the scissor suspension from adequately reducing the vibrations transmitted from the machine to the seat. Additionally, roller-type scissor suspensions are susceptible to dirt and debris building up in the tracks that inhibit proper movement of the rollers and promote wear and premature failure of the roller-type scissor suspension.

Other scissor suspensions include linkage-type suspensions that permit a strong close-fitting scissor suspension without the looseness associated with roller-type scissor suspensions. Additionally, because of the typically close-fitting assembly of linkage-type scissor suspensions, linkage-type scissor suspensions have better wear patterns and longer service life than roller-type scissor suspensions.

However, linkage-type scissor suspensions may suffer from excessive friction and stiffness, which may prevent linkage-type scissor suspensions from properly moving to dampen the vibrations and shocks of machine use and travel. Additionally, linkage-type scissor suspensions do not support integrated fore-aft or lateral motion dampening.

Typically, these roller-type and linkage-type scissor suspensions are used to help isolate a seat of a machine from the vibrations of the machine, which provides a more comfortable working environment to machine operators. In recent years, more and more equipment has been connected and attached to the seat, significantly increasing the weight that a scissor suspension is required to support. However, these roller-type and linkage-type scissor suspensions may not be robust enough to support this additional weight and effectively dampen the vibrations of the machine. Additionally, when these roller-type and linkage-type scissor suspensions are used, they suffer from accelerated wear and premature failure resulting from this increased weight.

The present invention is directed to overcome one or more of the problems as set forth above.

Summary of the Invention

In one example, a scissor suspension may include a first arm having a first end configured for pivotal attachment to a structure and a second end. A first bearing may be pivotally connected proximate to the second end of the first arm and may be moveably coupled to a first rail. A second arm having a first end and a second end may be pivotally connected to the first arm between the first and second ends of the first and second arms.

In another example, a scissor suspension may include a scissor assembly moveably connecting a first frame with a second frame with a first damper disposed to dampen movement of the second frame relative to the first frame. The scissor assembly may include a first arm having a first end pivotally attached to the first frame and a second end. A first bearing may be pivotally connected proximate to the second end of the first arm and moveably coupled to a first rail attached to the second frame. A second damper disposed to dampen movement of the second frame relative to the first bearing. The scissor assembly may also include a second arm having a first end and a second end that may be pivotally connected to the first arm between the first and second ends of the first and second arms.

A method is also provided for using an example of a scissor suspension. The scissor suspension may include a first arm having a first end pivotally attached to a structure and a second end. The scissor suspension may also include a first bearing pivotally connected proximate to the second end of the first arm and a second arm having a first end and a second end that may be pivotally connected to the first arm between the first and second ends of the first and second arms. The first bearing may be moveably coupled to the first rail and the scissor suspension may also include a damper disposed to dampen movement of the first rail relative to the structure.

The method may include the step of moving the first bearing along the first rail in response to an input motion of the structure. The method may also include the step of dampening movement of the first rail relative to the structure.

Brief Description of the Drawings

Figure 1 is a perspective view of an operator compartment of a machine.

Figure 2 is a perspective view of a scissor suspension for use in the operator compartment of Figure 1.

Figure 3a is a cross sectional view along line 3-3 of Figure 2 of the rail of the scissor suspension.

Figure 3b is a cross sectional view along line 3-3 of Figure 2 of an alternative configuration of the rail of the scissor suspension.

Figure 4a is a cross sectional view along line 4-4 of Figure 2 of a bearing of the scissor suspension.

Figure 4b is a cross sectional view along line 4-4 of Figure 2 of another configuration of the bearing of the scissor suspension.

Figure 5 is a perspective view of an alternative second frame of the scissor suspension.

Detailed Description

Referring to Figure 1, a perspective view illustrates a structure 100, which may be a machine 102 that includes an operator compartment 104. The machine 102 may be a backhoe loader, agricultural tractor, track-type tractor, articulated truck, wheel loader, and other types of construction, mining, or agricultural machinery.

As shown, the operator compartment 104 may include a seat 106 mounted on a suspension system 108. The suspension system 108 is attached to the structure 100 and dampens the vibrations associated with the operation of the machine 102 in order to increase operator comfort while seated in the seat 106.

The suspension system 108 may include a shroud 110 that conforms to the movement of the suspension system 108. The shroud 110 helps prevents contaminates such as water, dirt, rocks and other objects from affecting the performance of the suspension system 108. The shroud 110 may be made of cloth, an elastomer or other plastic, and any other material known in the art, that moves with the actuation of the suspension system 108.

Referring to Figure 2, a perspective view of a scissor suspension 120 for use in the suspension system 108 shown in Figure 1. The scissor suspension 120 may include a first frame 122 that facilitates the attachment of the scissor suspension 120 to the machine 102. For example, the first frame 122 may include mounting holes 124 that permit the first frame 122 to be bolted to the machine 102. Alternatively, the first frame 122 may be attached to the machine 102 by welding, clamps, adhesives, mechanical fasteners, or any other means known in the art.

As shown, the scissor suspension 120 may include a plurality of first arms 126. Of course, the scissor suspension 120 may include a single first arm 126. Because the first arms 126 are similar to each other and are connected together so that they operate as one, only one of the first arms 126 will be described hereafter in detail.

The first arm 126 has a first end 128 and a second end 130. The first end 128 of the first arm 126 may be configured for pivotal attachment to a structure 100. For example, the first end 128 may be pivotally attached to the first frame 122.

The scissor suspension 120 may also include a first bearing 132 pivotally connected proximate to the second end 130 of the first arm 126. The first bearing 132 may be a linear bearing, a sleeve bearing, roller bearing, or any other type of low friction bearing known in the art.

The first bearing 132 may be moveably coupled to a first rail 134. The first rail 134 may be attached to another structure 136, such as the seat 106 of Figure 1 or a second frame 138 as shown.

A second arm 140 having a first end 142 and a second end 144 is pivotally connected to the first arm 126 between the first and second ends 128, 130, 142, 144, of the first and second arms 126, 140. Additionally, the first and second arms 126, 140 may be straight or curved.

A second bearing 146 may be pivotally connected proximate to the first end 142 of the second arm 140 and moveably coupled to a second rail 148. The second bearing 146 may be a linear bearing, a sleeve bearing, roller bearing, or any other type of low friction bearing known in the art.

The second rail 148 may be attached to the first frame 122 so that a gap 150 may be disposed between the second rail 148 and the first frame122. The gap 150 permits dirt and debris to fall away from the second rail 148 as the second bearing 146 moves back and forth over the second rail 148. Consequently, the second bearing 146 may be less likely to suffer from failure related to dirt and debris.

The scissor suspension 120 may include a third bearing 152 pivotally connected proximate to the second end 144 of the second arm 140. The third bearing 152 may be moveably coupled to a third rail 154. The third bearing 152 may be a linear bearing, a sleeve bearing, roller bearing, or any other type of low friction bearing known in the art. Of course, the third bearing 152 is optional and may be replaced by a pivot or a roller in some configurations.

The scissor suspension 120 may also include a damper 160 disposed to dampen motion of the first rail 134 relative to the second rail 148. For example, the damper 160 may have a first end 162 pivotally attached to the first frame 122 and a second end 164 pivotally connected to the second arm 140 through a connection member 166. Alternatively, the damper 160 may have a first end 162 attached to the second bearing 146 and the second end 164 attached

to the first frame 122 to dampen movement of the second bearing 146 along the second rail 148 and thus, dampen motion of the first rail 134 relative to the second rail 148 or in other words, dampen movement of the second frame 138 relative to the first frame 122.

Additionally, scissor suspension 120 may include a second damper 168 disposed to dampen movement of the second frame 138 relative to the first bearing 132. For example, the second damper 168 may be disposed between the third bearing 152 and a positioning tab 170 the second frame 138 to dampen movement of the second frame 138 relative to the first bearing 132. The positioning tabs 170 of the second frame 138 may be used to limit the range of motion of the first and third bearings 132, 152.

A third damper 172 may also be disposed between the third bearing 152 and an end tab 174 the second frame 138 to dampen movement of the second frame 138 relative to the first bearing 132. Consequently, the first and second dampers 160, 172 are able to provide fore and aft motion isolation from the structure 100 while the first damper 160 provides vertical motion isolation from the structure 100. Of course, the first and second dampers 160, 172 may be disposed in other ways known in the art to dampen the motion of other components of the scissor suspension 120 relative to the structure 100.

The scissor suspension 120 may also include springs 176 or other actuators known in the art that return the second frame 138 to a desired position relative to the second and third bearings 146, 152.

The positioning tabs 170 may be used to attach the first and third rail 134, 154 to the second frame 138. In some configurations, the first rail 134 and the third rail 154 are integrally formed as a single rail that extends through the positioning tabs 170 and is attached to the end tabs 174 of the second frame 138.

Referring to Figure 3a, a cross sectional view along line 3-3 of Figure 2 illustrates a configuration of the first rail 134 of the scissor suspension

120. As shown, the first rail 134 may have a circular exterior profile 177 and a solid cross sectional area. Alternatively, the first rail 134 may have a hollow cross sectional area.

Figure 3b illustrates another configuration of the first rail 134 of the scissor suspension 120. As shown, the first rail 134 may have an exterior profile having a noncircular shape that extends along the longitudinal axis 178 of the first rail 134. The noncircular shape prevents rotation of the first bearing 132 about the longitudinal axis 178 of the first rail 134. For example, the first rail 134 may have a polygonal exterior profile or may be keyed to limit the potential motion of the first bearing 132 to linear motion along the longitudinal axis 178 of the first rail 134.

Additionally, the second and third rails 148, 154 may have the same exterior profile as the first rail 134. Consequently, the second and third rails 148, 154 may have circular or noncircular cross sectional profiles extending along its longitudinal axis 180, 182.

Referring to Figure 4a, a cross sectional view along line 4-4 of Figure 2 illustrates a configuration of the second bearing 146 coupled to the second rail 148. The second rail 148 may be positioned above the first frame 122 so that the gap 150 is disposed between the second rail 148 and the first frame 122.

The second bearing 146 may be a linear bearing, a roller bearing, or another bearing that includes a housing 184 configured for pivotally coupling to the second arm 140. The second bearing 146 may include a plurality of ball bearings or rollers 186 that roll over a raceway 187 of second rail 148. The plurality of ball bearings or rollers 186 provide a plurality of points of contact 188 between the plurality of ball bearings or rollers 186 and the second rail 148. The plurality of points of contact 188 may be configured to provide contact on opposite sides of the second rail 148 and may be separately disposed radially about or longitudinally along the second rail 148. The plurality of points of

contact 188 provides a sturdier scissor suspension assembly than is possible with roller-type scissor suspensions without the friction of linkage-type suspensions.

Additionally, the second bearing 146 may include a wiper 190 that may move debris off the second rail 148 and prevent debris from being disposed between the second bearing 146 and the second rail 148 as the second bearing 146 moves over the second rail 148. In other words, the wiper 190 wipes debris from the raceway 187 of the second rail 148 so that the debris fall through the gap 150 to the first frame 122 as the second bearing 146 moves along the second rail 148.

Referring to Figure 4b, a cross sectional view along line 4-4 of Figure 2 illustrates another configuration of the second bearing 146 coupled to the second rail 148. As shown, this configuration of the second bearing 146 may be a sleeve bearing that may include a housing 192 having a bearing surface 194' that closely follows the exterior profile 177 of the second rail 148.

A thin layer of lubricant 196 may be disposed between the bearing surface 194 and the second rail 148 so that the second bearing 146 does not contact the second rail 148 as the second bearing 146 slides on the lubricant 196 along the second rail 148 in response to the input motion of the structure 100. The housing 192 may also include a lubricant reservoir 198 for maintaining the thin layer of lubricant 196 between the housing 192 and the second rail 148. The second bearing 146 may also include a valve 200 for replenishing the lubricant reservoir 198 over time and wipers 202 for maintaining the thin layer of lubricant 196 between the housing 192 and the second rail 148.

Of course, the first and third bearings 132, 152 may be similarly configured as the second bearing 146 as shown in Figures 4a and 4b and may be a sleeve bearing, a linear bearing, or a roller bearing.

Referring to Figure 5, an exploded view illustrates an alternative second frame 138 that may be used in place of the second frame 138, shown in Figure 2, with the scissor suspension 120. As shown, a third frame 212 may be

moveably coupled to the second frame 138 by a coupling 214. The third frame 212 may include mounting holes 216 or other attachment structures known in the art for attaching the third frame 212 to the seat 106 shown in Figure 1.

The coupling 214 may provide lateral isolation to the third frame 212 from the movements of the structure 100, the first and second frames 122, 138. The coupling 214 may include a rail 218 attached to the second frame 138 and a bearing 220 moveably coupled to the rail 218. The bearing 220 may be attached to the third frame 212.. Of course, the rail 218 may be attached to the third frame 212 and the bearing 220 may be attached to the second frame 138

As shown, the bearing 220 may be a slide way. Of course, the first, second, and third bearings 132, 146, 152 discussed above may be configured similarly as bearing 220.

The coupling 214 may include a damper 222 disposed to dampen movement of the third frame 212 relative to the second frame 138. For example, the damper 222 may be disposed to engage the bearing 220 and a stop 224 attached to the rail 218. Alternatively, the stop 224 may be attached to the second frame 138. The damper 222 may be disposed to dampen movement between the third frame 212 and the second frame 138.

The stop 224 may be used to limit the displacement of the bearing 220 on the rail 218. The damper 222 may include a spring 226 that may be used to return the bearing 220 to a desired position between the stops 224. Of course, some of the bearings 220 may not be limited by stops 224 and may not be disposed to engage a damper 222.

In conclusion, a scissor suspension system is provided that provides, vertical, fore-aft, and lateral isolation from the vibrations and motion of the structure 100 or machine 102. The fore-aft isolation may be provided integrally with the scissor suspension as shown in Figure 1 with the addition of a minimal amount of parts. The scissor suspension may also provide a sturdier assembly than roller-type scissor suspensions. The scissor suspension may also

be able to operate with less friction than linkage-type scissor suspensions. This performance may be achieved through the use of bearings in place of one or more rollers or linkage arms of prior art suspension systems.

The scissor suspension may include parts made of metal, plastic, ceramic, or a composite material. For example, the bearings may be made of brass, powdered metal, steel, iron, titanium, PTFE, and other materials known in the art.

Industrial Applicability

The scissor suspension 120 may be used to dampen the motion and vibration transmitted from the structure 100 to the seat 106 of Figure 2. More specifically, the scissor suspension 120 may be disposed between the seat 106 of the operator compartment 104 and the machine 102 to provide a more comfortable operator environment.

The scissor suspension 120 may be operated by moving the first bearing along the first rail in response to an input motion of the structure 100 and dampening the movement of the first rail 134 relative to the first frame 122. Dampening the movement of the first rail 134 relative to the first frame 122 may be accomplished by dampening the vertical motion of the first frame 122 relative to the first bearing 132. The scissor suspension 120 may also be operated by moving the second bearing 146 along the second rail 148 in response to the input motion of the structure 100 or pivoting the first arm 126 relative to the first frame 122.

Additionally, in some configurations, the first and second bearings 132, 146 may operate to wipe the raceway 187 of the first and second rails 134, 148 as the first and second bearings 132, 146 respectively move along the first and second rails 134, 148.

In configurations of the scissor suspension 120 that include a second or third damper 168, 172, the scissor suspension 120 may be operated by damping the motion of the second bearing 146 along the second rail 148 relative

to the second frame 138 to provide fore-aft isolation of the seat 106 from the structure 100. Additionally, in configurations where a third frame 212 is moveably coupled to the second frame 138, the scissor suspension 120 operates to provide lateral dampening of a laterally oriented input motion by moving the bearing 220 along the rail 218 and dampening the movement of the third frame 212 relative to the second frame 138.

Where the first and second rails 134, 148 have noncircular exterior profiles, the suspension system may operate to prevent the rotation of the first and second bearings 132, 146 respectively about the longitudinal axis 178, 180 of the first and second rails 134, 148.

It will be apparent to those skilled in the art that various modifications and variations can be made without departing from the scope or spirit of the invention. For example, the third bearing 152 may be pivotally attached to the second frame 138 to provide only isolation of vertical input motion. Additionally, other embodiments of the invention will be apparent to those skilled in the art from consideration of the specification and practice of the invention disclosed herein. It is intended that the specification and examples be considered as exemplary only.

Claims

1. A scissor suspension (120) comprising:

a first arm (126) including a first end (128) and a second end (130), wherein the first arm (126) is configured for pivotal attachment to a first frame(122) proximate the first end (128);

a first bearing (123) pivotally connected proximate to the second end (130) of the first arm (126);

a second arm (140) including a first end (142) and a second end (144), wherein the second arm (140) is pivotally connected to the first arm (126) between the first and second ends (128,142,130,144) of the first and second arms (126, 140); and

a first rail (134), wherein the first bearing is moveably coupled to the first rail (134).

2. The scissor suspension of claim 1, wherein the first bearing (123) maintains at least two points of contact (188) with the first rail (134) as the first bearing (123) moves along the first rail (134).

3. The scissor suspension of claim 2, wherein the at least two points of contact (188) between the first bearing (132) and the first rail (134) are provided for by two separate ball bearings (186) of the first bearing (132).

4. The scissor suspension of claims 2, or 3, wherein the two points of contact (188) are separately and radially disposed about the first rail (134).

5. The scissor suspension of claim 1, wherein the first bearing (132) is a sleeve bearing.

6. The scissor suspension of claims 1, 2, 3, 4 or 5, further comprising;

a second bearing (146) pivotally connected proximate to the first end (142) of the second arm (140), wherein the second bearing (146) is moveably coupled to a second rail (148);

a third bearing (152) pivotally connected proximate to the second end (144) of the second arm (140), wherein the third bearing (152) is moveably coupled to a third rail (154),

a damper (160) disposed to dampen motion of the first rail (134) relative to the second rail (148);

a second frame (138) attached to the first rail (134); and

a damper (168) disposed to dampen movement of the first frame (122) relative to the first bearing (132).

7. The scissor suspension of claim 6, further comprising a third frame (212) moveably coupled to the second frame (138), wherein the coupling (214) between the third frame (212) and the second frame (138) includes a rail (218), a bearing (220), and a damper (222) disposed to dampen movement between the third frame (212) and the second frame (138).

8. The scissor suspension of claims 1, 2, 3, 4, 5, 6, or 7, wherein the first rail (134) is shaped to prevent rotation of the first bearing (132) about a longitudinal axis (178) of the first rail (134).

9. The scissor suspension of claims 6, 7, or 8, wherein the second rail (148) is attached to a first frame (122) so that a gap (150) is disposed between the second rail (148) and the first frame (122).

10. The scissor suspension of claims 7, 8, or 9, wherein the first and third rails (134, 154) are integrally formed as a single rail.

Fig. 1

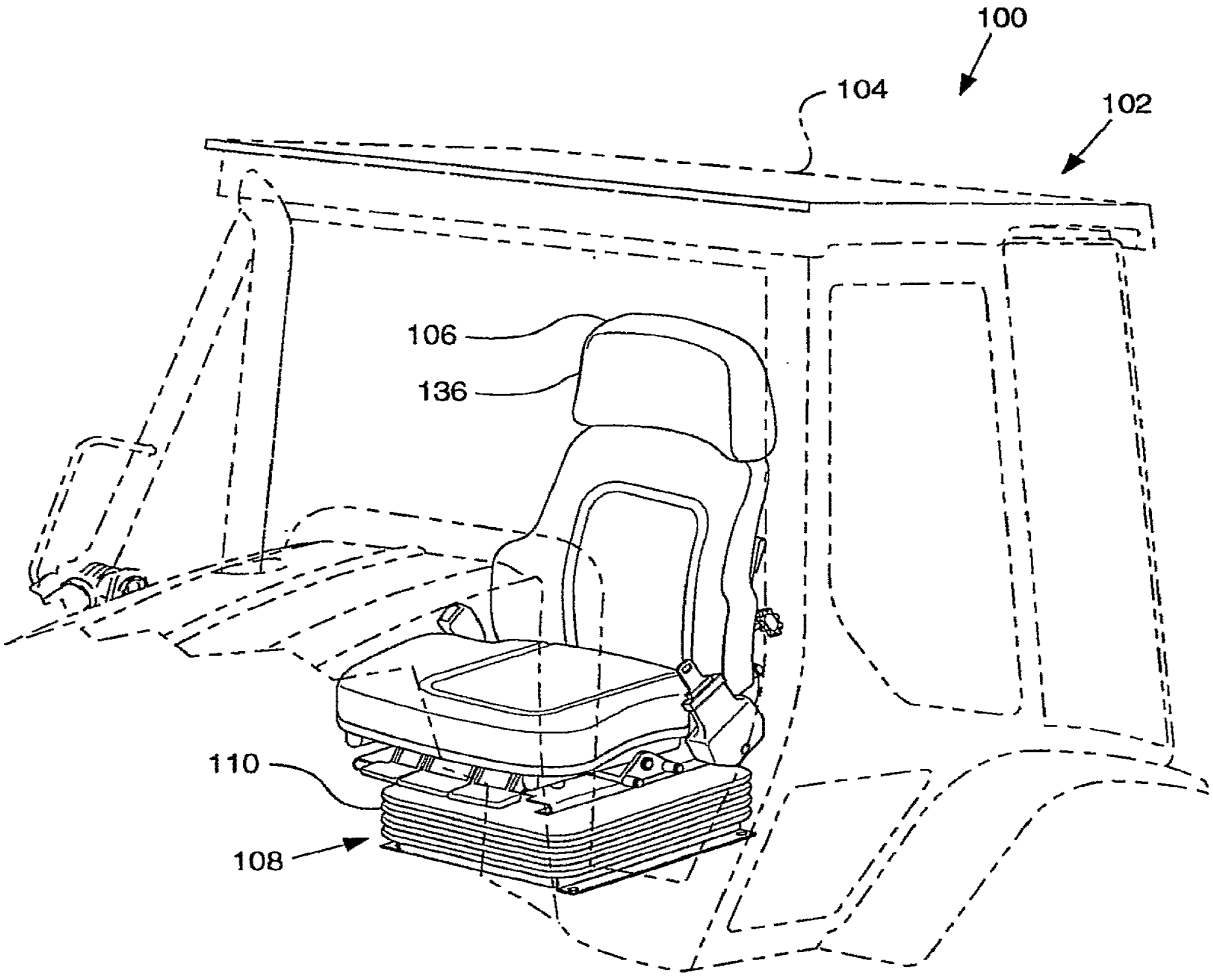


Fig-2-

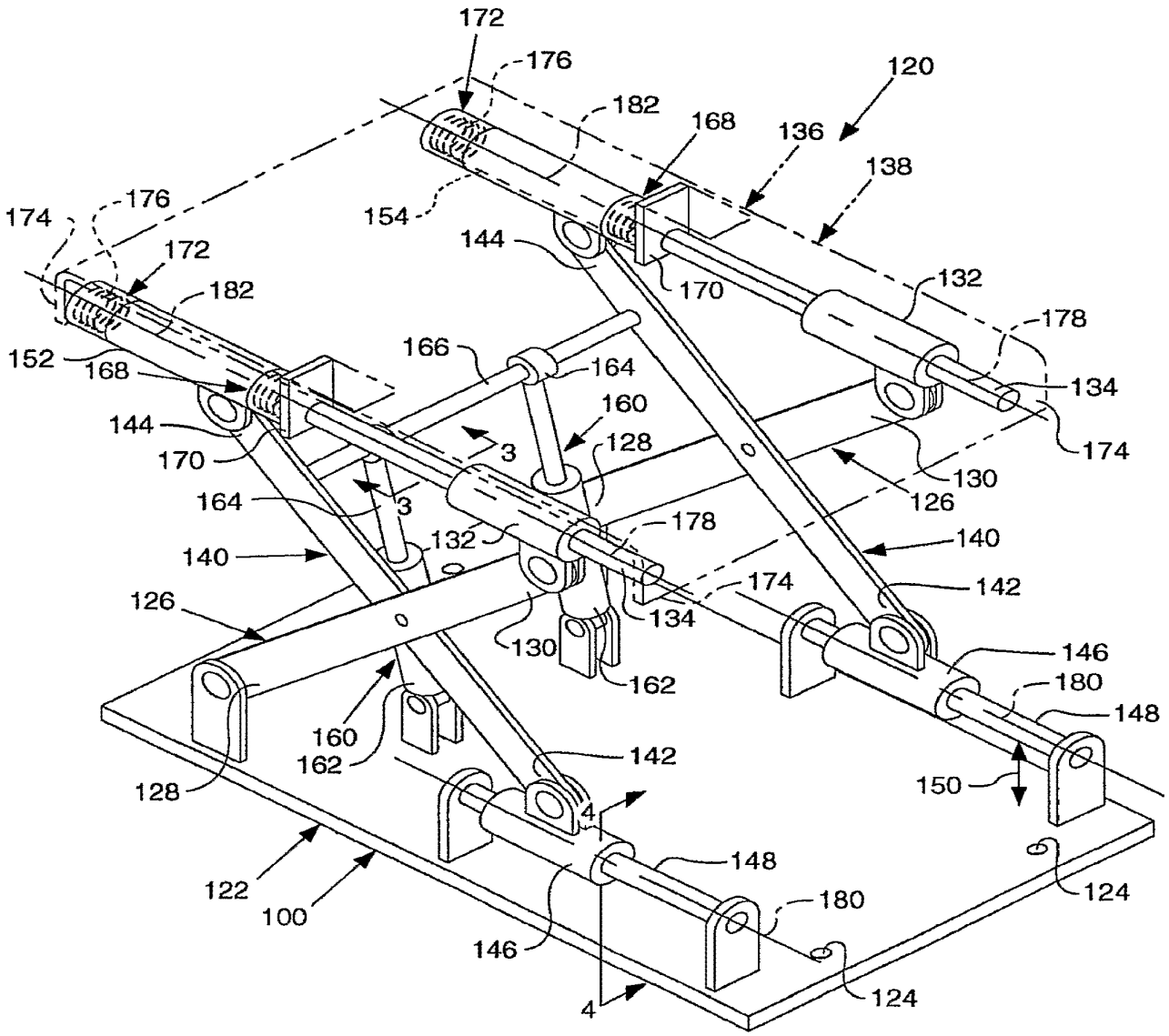

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Fig-3a-

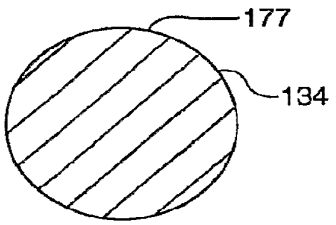


Fig-3b-

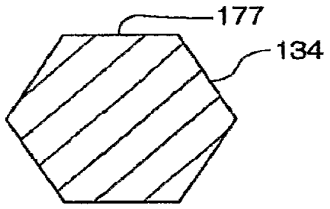


Fig-4a-

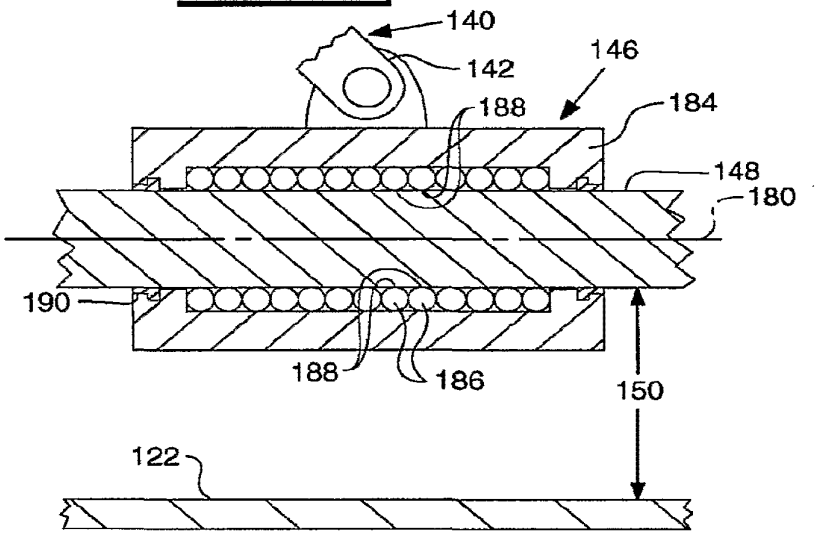


Fig-4b-

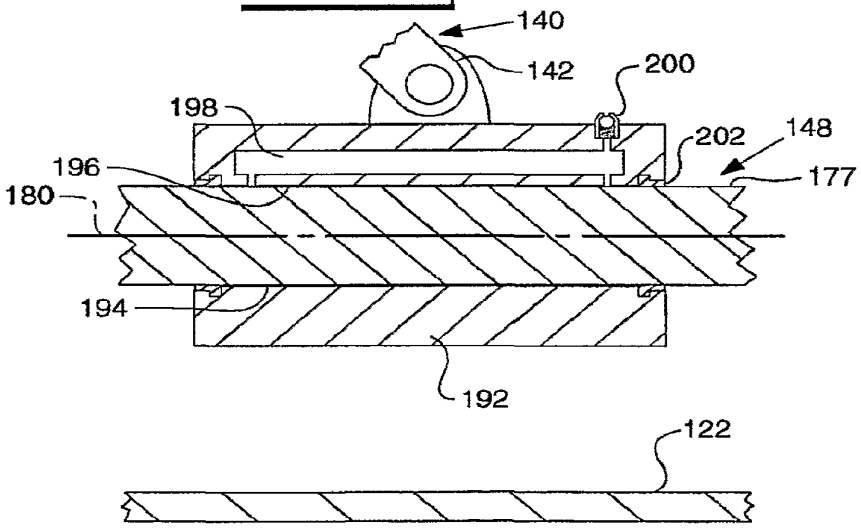
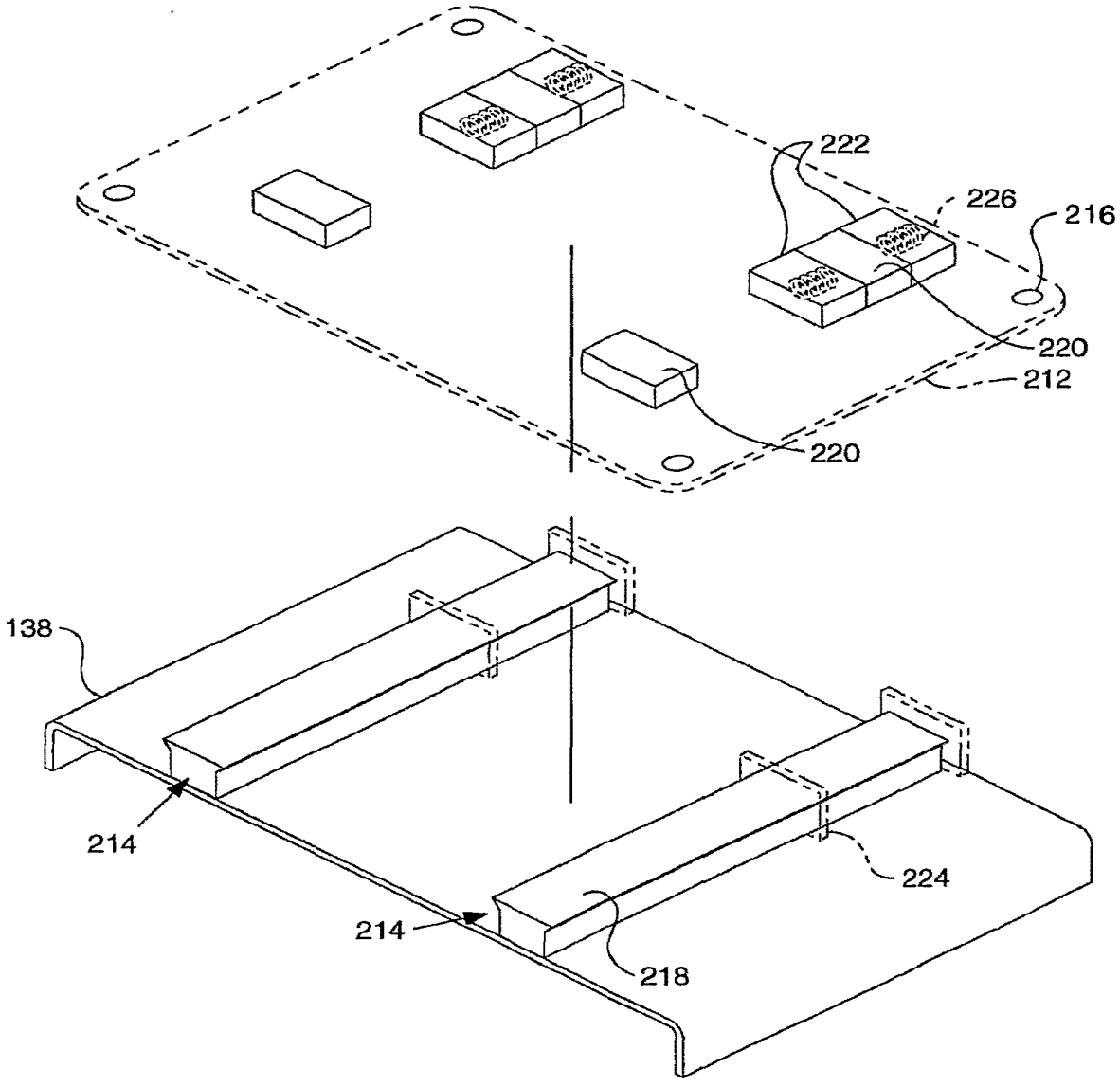


Fig. 5



(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

(19) Weltorganisation für geistiges Eigentum
Internationales Büro

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[Fortsetzung auf der nächsten Seite]

(54) **Title**: VEHICLE SEAT

(54) **Bezeichnung** : FAHRZEUGSITZ

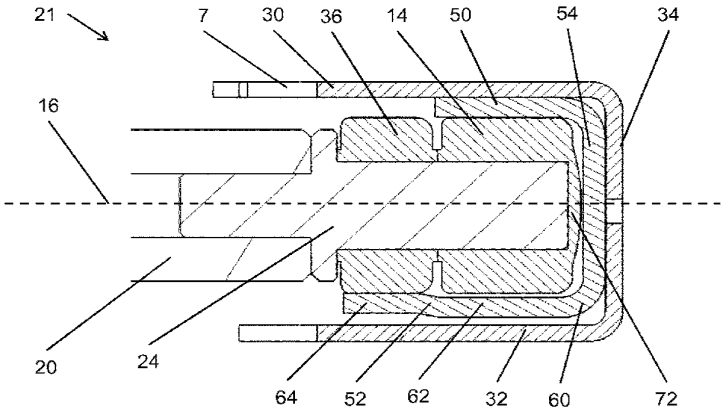


Fig. 3

(57) **Abstract**: The invention relates to a vehicle seat (1), in particular a commercial vehicle seat, comprising a scissor-type framework (3) for adjusting the height, said scissor-type framework having intersecting rockers (8a, 8b) and at least one frame (5, 7), and comprising at least one bearing device (21) by means of which at least one of the rockers (8a, 8b) is movably guided in the frame (5, 7). The bearing device (21) has a bearing roller (14), which can be rotated about a bearing axis (16) and which interacts with a first guide, and a compensation roller (36), which can be rotated about the bearing axis (16) and which interacts with a second guide. The second guide for the compensation roller (36) is attached to a base region (52) of an insert (60), and a lateral region (54) of the insert (60), said lateral region extending perpendicularly to the base region (52), is fixed to the frame (5, 7), and/or a head region (50) of the insert (60), said head region extending parallel to the base region (52), is fixed to the frame (5, 7), and the base region (52) is resiliently designed and presses against the compensation roller (36).

(57) **Zusammenfassung**:

[Fortsetzung auf der nächsten Seite]

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SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Veröffentlicht:

— *mit internationalem Recherchenbericht (Artikel 21 Absatz 3)*

Die Erfindung betrifft einen Fahrzeugsitz (1), insbesondere einen Nutzfahrzeugsitz, umfassend ein Scherengestell (3) zur Höheneinstellung, welches gekreuzte Schwingen (8a, 8b) und mindestens einen Rahmen (5, 7) aufweist, sowie mindestens eine Lagervorrichtung (21), mittels welcher mindestens eine der Schwingen (8a, 8b) in dem Rahmen (5, 7) beweglich geführt ist, wobei die Lagervorrichtung (21) eine um eine Lagerachse (16) drehbare Lastrolle (14), welche mit einer ersten Führung zusammenwirkt, und eine um die Lagerachse (16) drehbare Ausgleichsrolle (36), welche mit einer zweiten Führung zusammenwirkt, aufweist. Die zweite Führung für die Ausgleichsrolle (36) ist dabei an einem Fußbereich (52) eines Einlegers (60) angebracht, und ein Seitenbereich (54) des Einlegers (60), welcher sich rechtwinklig zu dem Fußbereich (52) erstreckt, ist an dem Rahmen (5, 7) befestigt und/oder ein Kopfbereich (50) des Einlegers (60), welcher sich parallel zu dem Fußbereich (52) erstreckt, ist an dem Rahmen (5, 7) befestigt, und der Fußbereich (52) ist federnd ausgebildet und drückt gegen die Ausgleichsrolle (36

Fahrzeugsitz

Die Erfindung betrifft einen Fahrzeugsitz, insbesondere einen Nutzfahrzeugsitz, mit den Merkmalen des Oberbegriffs des Anspruchs 1.

Stand der Technik

Aus der DE 10 2006 059 088 B4 ist ein gattungsgemäßer Fahrzeugsitz bekannt, welcher mittels eines Scherengestells höheneinstellbar ist.

Das Scherengestell umfasst dabei einen Unterrahmen, einen oberhalb desselben angeordneten Oberrahmen und beidseitig je ein Paar gekreuzter Schwingen. Die Schwingen des Scherengestells sind dabei paarweise mittels mehrerer Querrohre miteinander verbunden. Im hinteren Bereich des Fahrzeugsitzes sind die Schwingen mittels der Querrohre an dem Unterrahmen sowie an dem Oberrahmen angelenkt.

Im vorderen Bereich des Fahrzeugsitzes sind Lagervorrichtungen vorgesehen, mittels denen die Schwingen in dem Oberrahmen sowie in dem Unterrahmen in Längsrichtung beweglich geführt sind. Die Lagervorrichtungen weisen dabei je zwei drehbare Rollen auf, welche mit Führungen in dem Oberrahmen sowie in dem Unterrahmen zusammenwirken.

Bei einer Höhenänderung des Scherengestells laufen die Rollen auf entsprechenden Führungen im Oberrahmen sowie im Unterrahmen in Längsrichtung. Dabei läuft je einer der Rollen einer Lagervorrichtung auf einer oberen Führung und die andere der Rollen läuft auf einer unteren Führung.

Ein gattungsgemäßer Fahrzeugsitz ist auch aus der US 6,200,032 B1 bekannt. Zum Reduzierung des Spiels, insbesondere in Vertikalrichtung, sind dabei zwei Rollen mit verschiedenen Durchmessern vorgesehen, wobei die innen gelegene Rolle einen größeren Durchmesser aufweist als die außen gelegene Rolle.

Aufgabe

Der Erfindung liegt die Aufgabe zu Grunde, einen Fahrzeugsitz der eingangs genannten Art zu verbessern, insbesondere eine alternative Ausgestaltung zur Spielreduzierung anzugeben.

Lösung

Diese Aufgabe wird erfindungsgemäß durch einen Fahrzeugsitz mit den im Anspruch 1 genannten Merkmalen gelöst. Vorteilhafte Ausgestaltungen, welche einzeln oder in Kombination miteinander eingesetzt werden können, sind Gegenstand der Unteransprüche.

Ein gattungsgemäßer Fahrzeugsitz, insbesondere ein Nutzfahrzeugsitz, umfasst ein Scherengestell zur Höheneinstellung, welches gekreuzte Schwingen und mindestens einen Rahmen aufweist, sowie mindestens eine Lagervorrichtung, mittels welcher mindestens eine der Schwingen in dem Rahmen beweglich geführt ist, wobei die Lagervorrichtung eine um eine Lagerachse drehbare Lastrolle, welche mit einer ersten Führung zusammenwirkt, und eine um die Lagerachse drehbare Ausgleichsrolle, welche mit einer zweiten Führung zusammenwirkt, aufweist.

Erfindungsgemäß ist dabei vorgesehen, dass die zweite Führung für die Ausgleichsrolle an einem Fußbereich eines Einlegers angebracht ist, und dass ein Seitenbereich des Einlegers, welcher sich rechtwinklig zu dem Fußbereich erstreckt, an dem Rahmen befestigt ist, und/oder dass ein Kopfbereich des Einlegers, welcher sich parallel zu dem Fußbereich erstreckt, an dem Rahmen befestigt ist, und dass der Fußbereich elastisch verformbar ausgebildet ist und gegen die Ausgleichsrolle drückt.

Der Fußbereich drückt dabei aufgrund seiner Elastizität und einer Vorspannung mit der zweiten Führung gegen die Ausgleichsrolle, wodurch die Lastrolle gegen die erste Führung gedrückt wird. Dadurch ist zwischen den Führungen und der Lastrolle sowie der Ausgleichsrolle vorhandenes Spiel reduziert, beziehungsweise eliminiert.

Eine einfache Montage des Einlegers ergibt sich, wenn der Rahmen ein zum Inneren des Fahrzeugsitzes hin offenes C-Profil aufweist, welches einen oberen Schenkel, einen parallel zu dem oberen Schenkel verlaufenden unteren Schenkel und einen rechtwinklig zu dem oberen Schenkel verlaufenden Basisschenkel, welcher den oberen Schenkel mit dem unteren Schenkel verbindet, umfasst, wobei der Seitenbereich an dem Basisschenkel befestigt, vorzugsweise verschweißt ist und/oder der Kopfbereich an dem oberen Schenkel befestigt, vorzugsweise verschweißt ist.

Der Einleger weist dazu vorzugsweise ebenfalls ein offenes C-Profil auf, wodurch die Montage noch weiter vereinfacht ist.

Dabei bildet der Kopfbereich des Einlegers vorteilhaft die erste Führung für die Lastrolle.

Die Ausrichtung des Einlegers bei der Montage an dem Rahmen ist dadurch vereinfacht, dass der Kopfbereich parallel zu dem oberen Schenkel verläuft und an dem oberen Schenkel dicht anliegt.

Vorteilhaft ist der Fußbereich parallel oder zumindest weitgehend parallel zu dem unteren Schenkel angeordnet, wobei zwischen dem Fußbereich und dem unteren Schenkel ein Spalt vorgesehen ist. Dadurch ist eine elastische Verformung des Fußbereichs in Richtung auf den unteren Schenkel zu, ebenso wie in Richtung von dem unteren Schenkel weg, möglich.

Gemäß einer vorteilhaften Ausgestaltung der Erfindung umfasst der Fußbereich einen ersten Abschnitt, der an den Seitenbereich anschließt, und einen zweiten Abschnitt, der dem Seitenbereich abgewandt ist, wobei der zweite Abschnitt in Form einer Prägestufe ausgebildet ist und parallel versetzt zu dem ersten Abschnitt angeordnet ist. Die Prägestufe stellt dabei den erforderlichen Abstand zwischen dem ersten Abschnitt und der Lastrolle sicher um eine Berührung des Fußbereichs mit der Lastrolle zu vermeiden.

Vorzugsweise bildet dabei der zweite Abschnitt auch die zweite Führung für die Ausgleichsrolle.

Gemäß einer weiteren vorteilhaften Ausgestaltung der Erfindung ist auf dem Fußbereich eine Auflage aufgebracht, welche die zweite Führung für die Ausgleichsrolle bildet. Die Auflage stellt in diesem Fall den erforderlichen Abstand zwischen dem ersten Abschnitt und der Lastrolle sicher, um eine Berührung des Fußbereichs mit der Lastrolle zu vermeiden.

Vorzugsweise besteht der Einleger aus Metall, vorzugsweise aus Stahl. Dies ermöglicht ein Verschweißen des Einlegers mit dem Rahmen und gibt dem Fußbereich gleichzeitig die erforderliche Elastizität.

Figuren und Ausführungsformen der Erfindung

Im Folgenden ist die Erfindung anhand von in den Zeichnungen dargestellten vorteilhaften Ausführungsbeispielen näher erläutert. Die Erfindung ist jedoch nicht auf diese Ausführungsbeispiele beschränkt. Es zeigen:

Fig. 1: eine schematische Darstellung eines Fahrzeugsitzes,

Fig. 2: eine perspektivische Darstellung eines Fahrzeugsitzes ohne Sitzteil,

Fig. 3: einen Schnitt durch eine Lagervorrichtung gemäß einem ersten Ausführungsbeispiel senkrecht zur Längsrichtung,

Fig. 4: eine Frontalansicht einer Lagervorrichtung gemäß dem ersten Ausführungsbeispiel in Längsrichtung gesehen,

Fig. 5: einen Schnitt durch eine Lagervorrichtung gemäß einem zweiten Ausführungsbeispiel senkrecht zur Längsrichtung,

Fig. 6: eine Frontalansicht einer Lagervorrichtung gemäß dem zweiten Ausführungsbeispiel in Längsrichtung gesehen,

Fig. 7: einen Schnitt durch eine Lagervorrichtung gemäß einem dritten Ausführungsbeispiel senkrecht zur Längsrichtung,

Fig. 8: eine Frontalansicht einer Lagervorrichtung gemäß dem dritten Ausführungsbeispiel in Längsrichtung gesehen,

Fig. 9: eine perspektivische Darstellung einer Lagervorrichtung gemäß dem dritten Ausführungsbeispiel und

Fig. 10: eine perspektivische Darstellung zweier Lagervorrichtungen an Ober- und Unterrahmen eines Fahrzeugsitzes.

Ein Fahrzeugsitz 1 für ein Nutzfahrzeug weist ein Scherengestell 3 auf, welches einen Unterrahmen 5, einen oberhalb desselben angeordneten Oberrahmen 7 und beidseitig je ein Paar gekreuzter erster Schwingen 8a und zweiter Schwingen 8b umfasst. Ein Querrohr 9 verbindet die beiden Kreuzungspunkte und definiert zugleich eine Scherenachse, um welche die Schwingen 8a und 8b relativ zueinander schwenken können.

Die Anordnung des Fahrzeugsitzes 1 innerhalb des Fahrzeugs und dessen gewöhnliche Fahrtrichtung definieren die im Folgenden verwendeten Richtungsangaben. Dabei wird eine senkrecht zum Erdboden orientierte Richtung im Folgenden als Vertikalrichtung bezeichnet und eine Richtung senkrecht zur Vertikalrichtung und senkrecht zur Fahrtrichtung wird im Folgenden als Querrichtung bezeichnet.

Die ersten Schwingen 8a sind an ihren hinteren Enden mittels eines Halterrohrs 18 miteinander verbunden und an dem Oberrahmen 7 angelenkt. An ihren vorderen Enden sind die ersten Schwingen 8a mittels eines Lagerrohrs 20 verbunden und beidseitig mittels je einer Lagervorrichtung 21 in dem Unterrahmen 5 in Längsrichtung, welche annähernd der Fahrtrichtung entspricht, beweglich geführt.

Die zweiten Schwingen 8b sind an ihren hinteren Enden mittels eines Halterrohrs 18 miteinander verbunden und an dem Unterrahmen 5 angelenkt. An ihren vorderen Enden sind die zweiten Schwingen 8b ebenfalls mittels eines Lagerrohrs 20 verbunden und beidseitig mittels je einer Lagervorrichtung 21 in dem Oberrahmen 7 in Längsrichtung beweglich geführt.

Das Querrohr 9, die Lagerrohre 20 und die Halterohre 18 erstrecken sich vorliegend in Querrichtung, ebenso wie die Scherenachse. Durch eine Schwenkbewegung der ersten Schwingen 8a relativ zu den zweiten Schwingen 8b um die Scherenachse ändert sich die Höhe des Oberrahmens 7 über dem Unterrahmen 5, im Folgenden kurz als Höhe des Scherengestells 3 bezeichnet. Mittels einer

Gasfeder 12 und vorzugsweise einem hier nicht dargestellten Dämpfer wird das Scherengestell 3 ein schwingfähiges System, welches den Sitzkomfort maßgeblich erhöht.

Der Fahrzeugsitz 1 weist ferner einen Sitzrahmen 6 auf, welcher einerseits in seinem hinteren Bereich am Oberrahmen 7 beidseitig angelenkt ist und andererseits in seinem vorderen Bereich mittels eines Neigungseinstellers anhebbar und absenkbar und damit in seiner Neigung relativ zum Scherengestell 3 einstellbar ist.

Der Fahrzeugsitz 1 weist auch eine Rückenlehne 10 auf, welche an dem Sitzrahmen 6 vorliegend neigungseinstellbar angebracht ist. Alternativ ist die Rückenlehne 10 auch an dem Oberrahmen 7 anbringbar. Die Rückenlehne 10 ist mit einem Bezug 28 überzogen. In einem in Vertikalrichtung oberen Bereich der Rückenlehne 10 ist eine Kopfstütze 40 vorgesehen. Die Rückenlehne 10 und der Sitzrahmen 6, welcher ein Sitzkissen umfasst, bilden ein Sitzteil 2.

Das Sitzteil 2 ist, gemeinsam mit dem Scherengestell 3, mittels zweier Schienenpaare verschiebbar, womit der Fahrzeugsitz 1 translatorisch in Längsrichtung, welche annähernd der Fahrtrichtung entspricht, einstellbar ist. Die beiden Schienenpaare sind dabei in Querrichtung zueinander versetzt und parallel zueinander angeordnet. Die beiden Schienenpaare sind im Wesentlichen identisch aufgebaut.

Jedes Schienenpaar umfasst eine erste Sitzschiene 45, welche auch als Oberschiene bezeichnet wird, und eine zweite Sitzschiene 46, welche auch als Unterschiene bezeichnet wird. Die zweite Sitzschiene 46 ist vorliegend fest mit der Struktur des Fahrzeugs verbunden und die erste Sitzschiene 45 ist fest mit dem Unterrahmen 5 des Fahrzeugsitzes 1 verbunden. Alternativ ist es denkbar, die zweite Sitzschiene 46 mittels eines Adapters oder einer Konsole mit der Struktur des Fahrzeugs zu verbinden. Weiterhin ist es denkbar, die erste Sitzschiene 45

mittels eines Adapters mit dem Unterrahmen 5 des Fahrzeugsitzes 1 zu verbinden.

Die erste Sitzschiene 45 ist dabei relativ zu der zweiten Sitzschiene 46 beweglich in dieser geführt. Mittels einer Verriegelungsvorrichtung ist die erste Sitzschiene 45 mit der zweiten Sitzschiene 46 verriegelbar. Eine Entriegelungseinheit, welche einen Entriegelungsbügel 44 umfasst, dient zum Entriegeln der Verriegelungsvorrichtung.

Der Entriegelungsbügel 44 ist in einem in Fahrtrichtung, beziehungsweise in Längsrichtung, vorderen Bereich des Fahrzeugsitzes 1 angeordnet und um eine vorliegend in Querrichtung verlaufende Schwenkachse schwenkbar gelagert. Durch Zug an dem Entriegelungsbügel 44 in Vertikalrichtung nach oben wird dieser um die Schwenkachse geschwenkt, wodurch die Verriegelungsvorrichtung entriegelt wird.

Der Entriegelungshebel 44 und die Schwenkachse sind dabei kinematisch dem Unterrahmen 5 sowie der ersten Sitzschiene 45 zugeordnet. Das bedeutet, bei einer Verschiebung des Sitzteils 2 in Längsrichtung bewegt sich der Entriegelungshebel 44 entsprechend mit, jedoch nicht bei einer Änderung der Höhe des Scherengestells 3, also bei einer Bewegung des Sitzteils 2 in Vertikalrichtung.

Die in Längsrichtung verlaufenden Teile des Oberrahmens 7 sowie des Unterrahmens 5 weisen je ein zum Inneren des Fahrzeugsitzes 1 hin offenes C-Profil auf. Jede Lagervorrichtung 21 weist eine Lastrolle 14 auf, welche um eine in Querrichtung verlaufende Lagerachse 16 drehbar gelagert ist und welche in ein offenes C-Profil des Oberrahmens 7 oder des Unterrahmens 5 ragt.

Das C-Profil des Oberrahmens 7 sowie das C-Profil des Unterrahmens 5 umfassen je einen oberen Schenkel 30 sowie einen unteren Schenkel 32, welcher in Vertikalrichtung unterhalb des oberen Schenkels angeordnet ist. Der obere

Schenkel 30 und der untere Schenkel 32 verlaufen parallel zueinander und sind durch einen Basisschenkel 34, welcher sich rechtwinklig dazu erstreckt, miteinander verbunden. Somit bilden der obere Schenkel 30, der untere Schenkel 32 und der Basisschenkel 34 im Querschnitt ein C-Profil.

Die Lastrolle 14 der Lagervorrichtung 21 ist dabei auf einer zylindrischen Lagerwelle 24 drehbar gelagert. Die Lagerwelle 24 ist mit dem Lagerrohr 20 fest verbunden, wobei die Mittelachsen des Lagerrohres 20 und der Lagerwelle 24 miteinander fluchten und die Lagerachse 16 der Lastrolle 14 bilden. Die Lastrolle 14 ist vorliegend annähernd zylindrisch ausgebildet.

Ferner ist eine Ausgleichsrolle 36 auf der zylindrischen Lagerwelle 24 um die Lagerachse 16 drehbar gelagert. Auch die Ausgleichsrolle 36 ist vorliegend annähernd zylindrisch ausgebildet. Die Ausgleichsrolle 36 hat vorliegend den gleichen Durchmesser wie die Lastrolle 14.

Vorliegend ist die Lastrolle 14 in Querrichtung außen auf der Lagerwelle 24 angeordnet, also dem Basisschenkel 34 des C-Profils zugewandt. Die Ausgleichsrolle 36 ist in Querrichtung innen auf der Lagerwelle 24 angeordnet, also dem Lagerrohr 20 zugewandt.

Innerhalb der C-Profile des Oberrahmens 7 sowie des Unterrahmens 5 sind jeweils Einleger 60 eingebracht, welche ebenfalls einen annähernd C-förmigen Querschnitt aufweisen. Jeder Einleger 60 weist dabei einen Kopfbereich 50, einen Fußbereich 52 und einen Seitenbereich 54 auf, welcher mit dem Kopfbereich 50 und dem Fußbereich 52 verbunden ist. Der Kopfbereich 50 ist dabei parallel zu dem oberen Schenkel 30 angeordnet, der Fußbereich 52 ist weitgehend parallel zu dem unteren Schenkel 32 angeordnet und der Seitenbereich 54 ist parallel zu dem Basisschenkel 34 des C-Profils angeordnet.

Der Kopfbereich 50 liegt dicht an dem oberen Schenkel 30 an, während zwischen dem Fußbereich 52 und dem unteren Schenkel 32 ein Spalt vorgesehen ist. Der

Seitenbereich 54 ist mit dem Basisschenkel 34 des C-Profils verschweißt, vorliegend mittels Laser-Schweißen.

Der Fußbereich 52 umfasst einen ersten Abschnitt 62, welcher an den Seitenbereich 54 anschließt, und einen zweiten Abschnitt 64, welcher an den ersten Abschnitt 62 anschließt und dem Seitenbereich 54 abgewandt ist. Der erste Abschnitt 62 und der Kopfbereich 50 sind dabei in Vertikalrichtung annähernd gegenüberliegend angeordnet und einander zugewandt.

Gemäß einem in Fig. 3 und Fig. 4 dargestellten ersten Ausführungsbeispiel und gemäß einem in Fig. 5 und Fig. 6 dargestellten zweiten Ausführungsbeispiel ist der zweite Abschnitt 64 in Form einer Prägestufe ausgebildet und liegt annähernd parallel in Vertikalrichtung versetzt zu dem ersten Abschnitt 62. Dabei befindet sich der erste Abschnitt 62 näher an dem unteren Schenkel 32 als der zweite Abschnitt 64.

Der Kopfbereich 50 bildet eine erste Führung für die Lastrolle 14 und der zweite Abschnitt 64 des Fußbereichs 52 bildet eine zweite Führung für die Ausgleichsrolle 36. Durch die Form der Prägestufe ist sichergestellt, dass die Ausgleichsrolle 36 in Kontakt mit dem zweiten Abschnitt 64 des Fußbereichs 52 steht, während die Lastrolle 14 in vertikaler Richtung von dem ersten Abschnitt 62 des Fußbereichs 52 beabstandet ist.

Der Einleger 60 besteht vorliegend aus Stahl und ist somit elastisch. Insbesondere ist der Fußbereich 52 elastisch und wirkt daher ähnlich wie eine Feder. Dabei drückt der zweite Abschnitt 64 in Vertikalrichtung nach oben gegen die Ausgleichsrolle 36. Dabei wird die Lastrolle 14 nach oben gegen den Kopfbereich 50 gedrückt.

So ist sichergestellt, dass die Ausgleichsrolle 36 und die Lastrolle 14 ständig Kontakt mit den entsprechenden Führungen haben und an der ersten Führung

sowie an der zweiten Führung anliegen. Dadurch sind Bauteiltoleranzen ausgleichbar und Spiel in Vertikalrichtung wird eliminiert.

Zum Spielausgleich in Querrichtung dient gemäß dem in Fig. 3 und Fig. 4 dargestellten ersten Ausführungsbeispiel eine an der Lastrolle 14 angebrachte Verbreiterung 72. Die Verbreiterung 72 befindet sich dabei an der dem Seitenbereich 54 des Einlegers 60 zugewandten Stirnseite der Lastrolle 14 und ragt in Querrichtung über die restliche Lastrolle 14 hinaus. Die Verbreiterung 72 liegt dabei an dem Seitenbereich 54 des Einlegers 60 an. Die Verbreiterung 72 ist vorliegend als kugelabschnittförmige Überhöhung der Stirnseite der Lastrolle 14 ausgebildet. Auch andere Ausgestaltungen sind denkbar.

Gemäß dem in Fig. 5 und Fig. 6 dargestellten zweiten Ausführungsbeispiel ist zum Spielausgleich in Querrichtung ein Gleitelement 70 vorgesehen, welches in eine in Querrichtung verlaufende Lagerbohrung in der Lagerwelle 24 eingeschoben ist. Das Gleitelement 70 liegt dabei an dem Seitenbereich 54 des Einlegers 60 an.

Gemäß einem in Fig. 7, Fig. 8 und Fig. 9 dargestellten dritten Ausführungsbeispiel schließt der zweite Abschnitt 64 geradlinig an den ersten Abschnitt 62 an. Auf dem zweiten Abschnitt 64 des Fußbereichs 52 ist eine Auflage 66 aufgebracht, vorliegend aufgeklebt, welche die zweite Führung für die Ausgleichsrolle 36 bildet, während der Kopfbereich 50 die erste Führung für die Lastrolle 14 bildet. Durch die Auflage 66 ist sichergestellt, dass die Ausgleichsrolle 36 in Kontakt mit der zweiten Führung steht, während die Lastrolle 14 in vertikaler Richtung von dem ersten Abschnitt 62 des Fußbereichs 52 beabstandet ist.

Die zweite Auflage 66 besteht vorliegend aus einem harten, nicht elastischen oder wenig elastischen Kunststoff. Es ist auch denkbar, dass die Auflage 66 aus einem elastischen Material, beispielsweise Gummi, besteht.

Auch bei dem dritten Ausführungsbeispiel besteht der Einleger 60 aus Stahl und ist somit elastisch. Insbesondere ist der Fußbereich 52 elastisch und wirkt daher

ähnlich wie eine Feder. Dabei drückt der zweite Abschnitt 64 mit der Auflage 66 in Vertikalrichtung nach oben gegen die Ausgleichsrolle 36. Dabei wird die Lastrolle 14 nach oben gegen den Kopfbereich 50 gedrückt.

So ist auch bei dem dritten Ausführungsbeispiel sichergestellt, dass die Ausgleichsrolle 36 und die Lastrolle 14 ständig Kontakt mit den entsprechenden Führungen haben und an der ersten Führung sowie an der zweiten Führung anliegen. Dadurch sind Bauteiltoleranzen ausgleichbar und Spiel in Vertikalrichtung wird eliminiert.

Zum Spielausgleich in Querrichtung dient gemäß dem in Fig. 7, Fig. 8 und Fig. 9 dargestellten dritten Ausführungsbeispiel ein Gleitelement 70, welches in eine in Querrichtung verlaufende Lagerbohrung in der Lagerwelle 24 eingeschoben ist und an dem Seitenbereich 54 des Einlegers 60 anliegt, ähnlich wie bei dem in Fig. 5 und Fig. 6 dargestellten zweiten Ausführungsbeispiel.

Es ist auch denkbar, zum Spielausgleich in Querrichtung, ähnlich wie bei dem in Fig. 3 und Fig. 4 dargestellten ersten Ausführungsbeispiel, an der Lastrolle 14 eine Verbreiterung anzubringen, welche sich an der dem Seitenbereich 54 des Einlegers 60 zugewandten Stirnseite der Lastrolle 14 befindet und in Querrichtung über die restliche Lastrolle 14 hinaus ragt. Die Verbreiterung liegt dann an dem Seitenbereich 54 des Einlegers 60 an.

Bei den hier beschriebenen Ausführungsbeispielen entsprechen die Lagervorrichtungen 21, welche mit dem Unterrahmen 5 zusammen wirken, in Aufbau und Funktion den hier beschriebenen Lagervorrichtungen 21 an dem Oberrahmen 7. In Fig. 7 ist ein Teil eines Fahrzeugsitzes mit Lagervorrichtungen 21 am Oberrahmen 7 und am Unterrahmen 5 dargestellt.

Die in der vorstehenden Beschreibung, den Ansprüchen und den Zeichnungen offenbarten Merkmale können sowohl einzeln als auch in Kombination für die

Verwirklichung der Erfindung in ihren verschiedenen Ausgestaltungen von Bedeutung sein.

Bezugszeichenliste

1	Fahrzeugsitz
2	Sitzteil
3	Scherengestell
5	Unterrahmen
6	Sitzrahmen
7	Oberrahmen
8a	erste Schwinge
8b	zweite Schwinge
9	Querrohr
10	Rückenlehne
12	Gasfeder
14	Lastrolle
16	Lagerachse
18	Halterohr
20	Lagerrohr
21	Lagervorrichtung
24	Lagerwelle
28	Bezug
30	oberer Schenkel
32	unterer Schenkel
34	Basisschenkel
36	Ausgleichsrolle
40	Kopfstütze
44	Entriegelungshebel
45	erste Sitzschiene
46	zweite Sitzschiene
50	Kopfbereich
52	Fußbereich

54 Seitenbereich
60 Einleger
62 erster Abschnitt
64 zweiter Abschnitt
66 Auflage
70 Gleitelement
72 Verbreiterung

Patentansprüche

1. Fahrzeugsitz (1), insbesondere Nutzfahrzeugsitz, umfassend
ein Scherengestell (3) zur Höheneinstellung, welches gekreuzte Schwingen (8a, 8b) und mindestens einen Rahmen (5, 7) aufweist,
sowie mindestens eine Lagervorrichtung (21), mittels welcher mindestens eine der Schwingen (8a, 8b) in dem Rahmen (5, 7) beweglich geführt ist,
wobei die Lagervorrichtung (21) eine um eine Lagerachse (16) drehbare Lastrolle (14), welche mit einer ersten Führung zusammenwirkt, und eine um die Lagerachse (16) drehbare Ausgleichsrolle (36), welche mit einer zweiten Führung zusammenwirkt, aufweist,
dadurch gekennzeichnet, dass
die zweite Führung für die Ausgleichsrolle (36) an einem Fußbereich (52) eines Einlegers (60) angebracht ist, und
dass ein Seitenbereich (54) des Einlegers (60), welcher sich rechtwinklig zu dem Fußbereich (52) erstreckt, an dem Rahmen (5, 7) befestigt ist, und/oder
dass ein Kopfbereich (50) des Einlegers (60), welcher sich parallel zu dem Fußbereich (52) erstreckt, an dem Rahmen (5, 7) befestigt ist, und
dass der Fußbereich (52) elastisch ausgebildet ist und gegen die Ausgleichsrolle (36) drückt.

2. Fahrzeugsitz (1) nach Anspruch 1, dadurch gekennzeichnet, dass der Rahmen (5, 7) ein zum Inneren des Fahrzeugsitzes (1) hin offenes C-Profil aufweist, welches einen oberen Schenkel (30), einen parallel zu dem oberen Schenkel (30) verlaufenden unteren Schenkel (32) und einen rechtwinklig zu dem oberen Schenkel (30) verlaufenden Basisschenkel (34), welcher den oberen Schenkel (30) mit dem unteren Schenkel (32) verbindet, umfasst,
wobei der Seitenbereich (54) an dem Basisschenkel (34) befestigt ist und/oder der Kopfbereich (50) an dem oberen Schenkel (30) befestigt ist.

3. Fahrzeugsitz (1) nach Anspruch 2, dadurch gekennzeichnet, dass der Einleger (60) ein offenes C-Profil aufweist.

4. Fahrzeugsitz (1) nach einem der Ansprüche 2 bis 3, dadurch gekennzeichnet, dass der Kopfbereich (50) die erste Führung für die Lastrolle (14) bildet.

5. Fahrzeugsitz (1) nach einem der Ansprüche 2 bis 4, dadurch gekennzeichnet, dass der Kopfbereich (50) parallel zu dem oberen Schenkel (30) verläuft und dass der Kopfbereich (50) an dem oberen Schenkel (30) dicht anliegt.

6. Fahrzeugsitz (1) nach einem der Ansprüche 2 bis 5, dadurch gekennzeichnet, dass der Fußbereich (52) zumindest weitgehend parallel zu dem unteren Schenkel (32) angeordnet ist, wobei zwischen dem Fußbereich (52) und dem unteren Schenkel (32) ein Spalt vorgesehen ist.

7. Fahrzeugsitz (1) nach einem der vorstehenden Ansprüche, dadurch gekennzeichnet, dass der Fußbereich (52) einen ersten Abschnitt (62), der an den Seitenbereich (54) anschließt, und einen zweiten Abschnitt (64), der dem Seitenbereich (54) abgewandt ist, umfasst, wobei der zweite Abschnitt (64) in Form einer Prägestufe ausgebildet ist und parallel versetzt zu dem ersten Abschnitt (62) angeordnet ist.

8. Fahrzeugsitz (1) nach Anspruch 7, dadurch gekennzeichnet, dass der zweite Abschnitt (64) die zweite Führung für die Ausgleichsrolle (36) bildet.

9. Fahrzeugsitz (1) nach einem der Ansprüche 1 bis 7, dadurch gekennzeichnet, dass eine Auflage (66) auf dem Fußbereich (52) aufgebracht ist, welche die zweite Führung für die Ausgleichsrolle (36) bildet.

10. Fahrzeugsitz (1) nach einem der vorstehenden Ansprüche, dadurch gekennzeichnet, dass der Einleger (60) aus Metall, vorzugsweise aus Stahl besteht.

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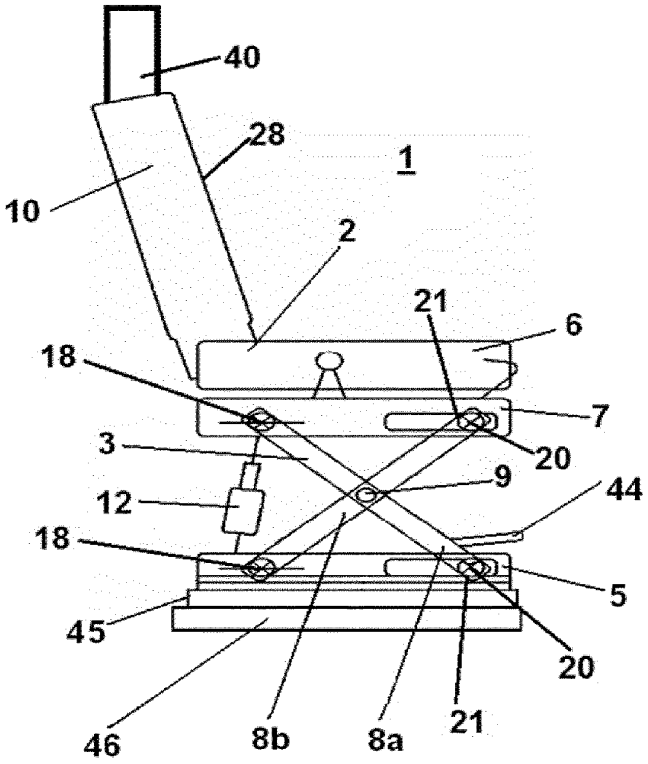

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Fig. 1

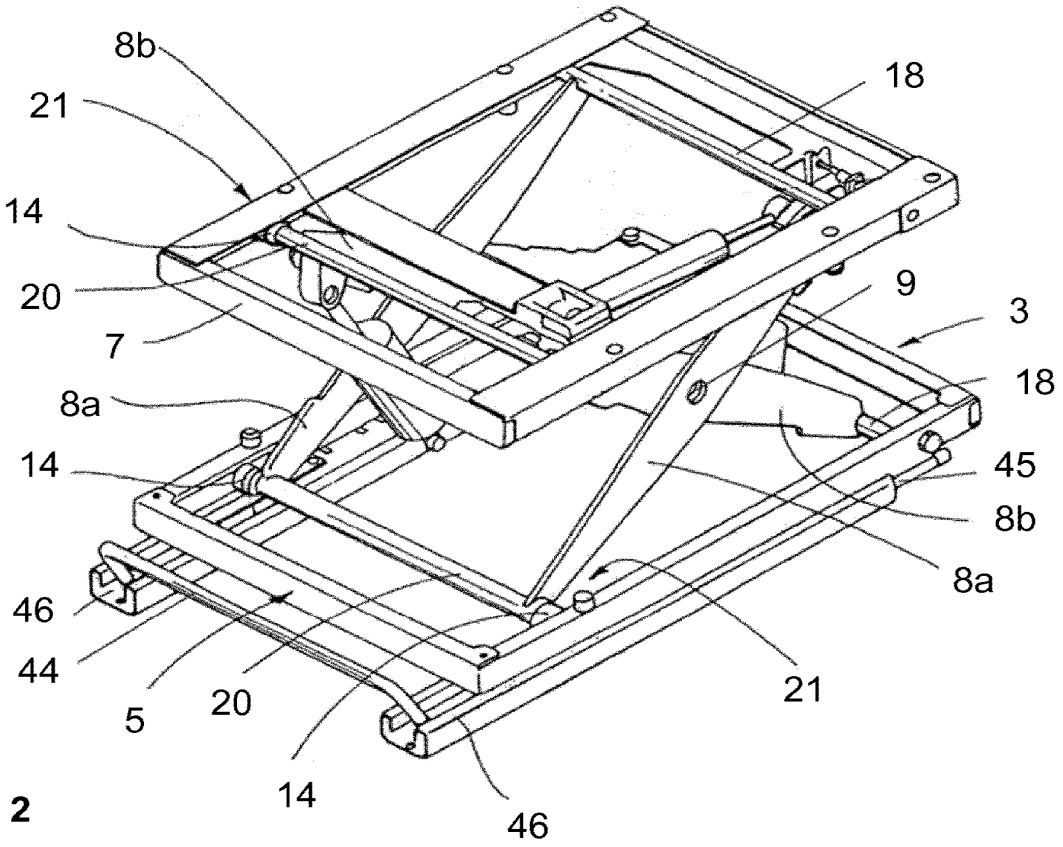

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Fig. 2

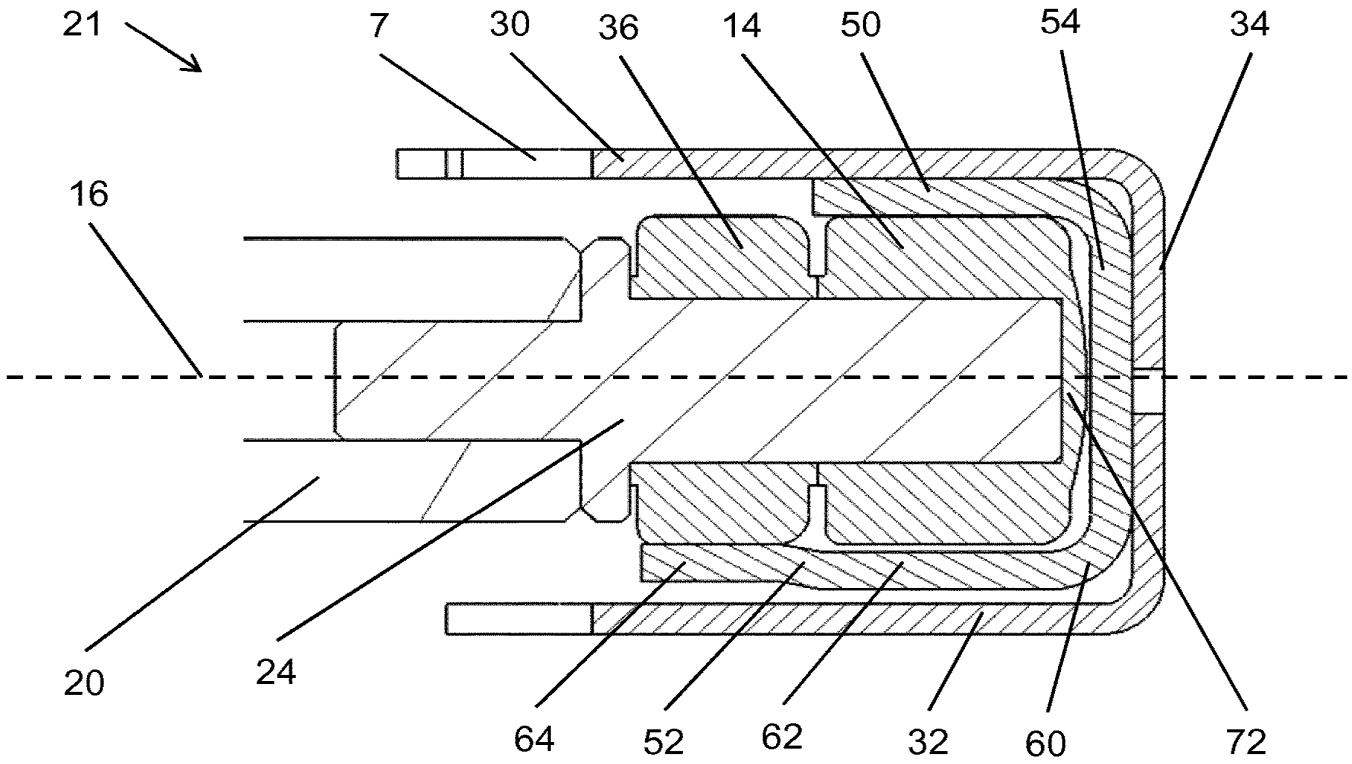

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Fig. 3

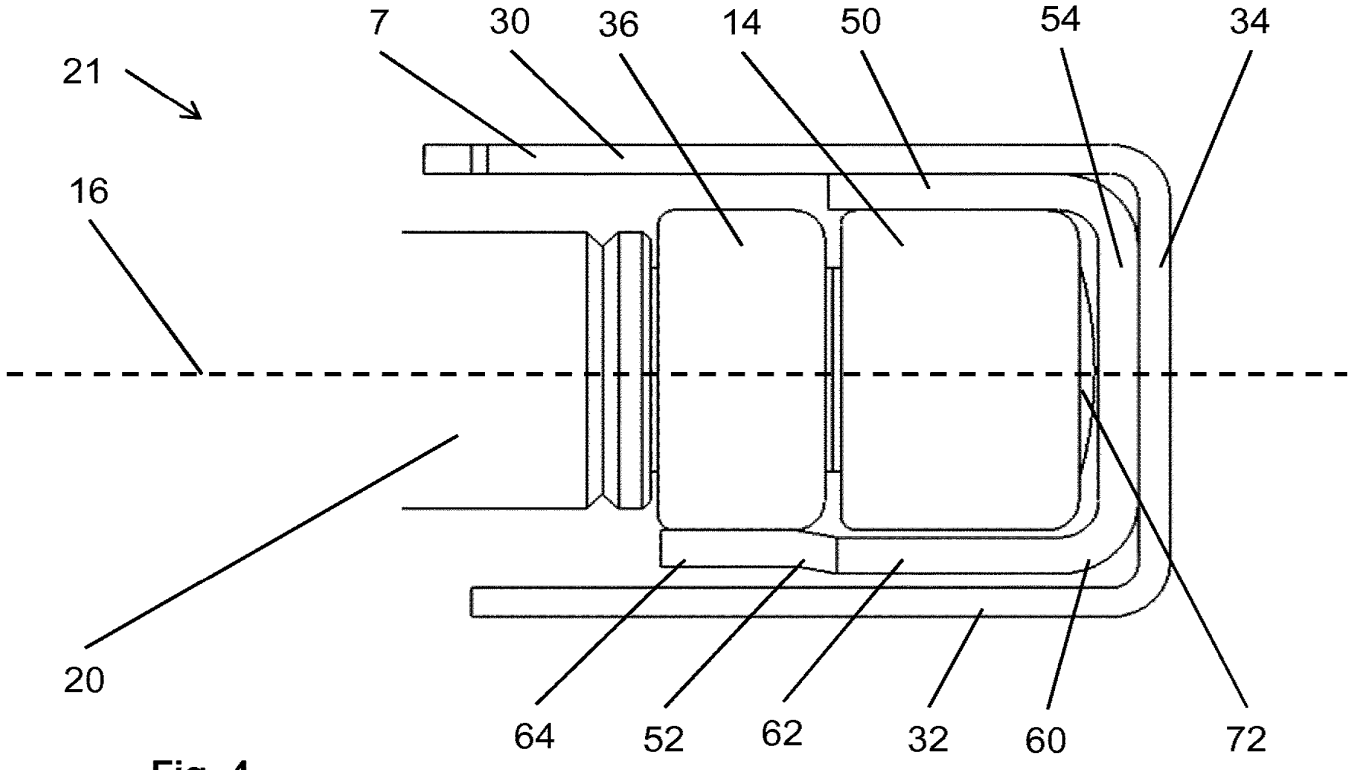

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Fig. 4

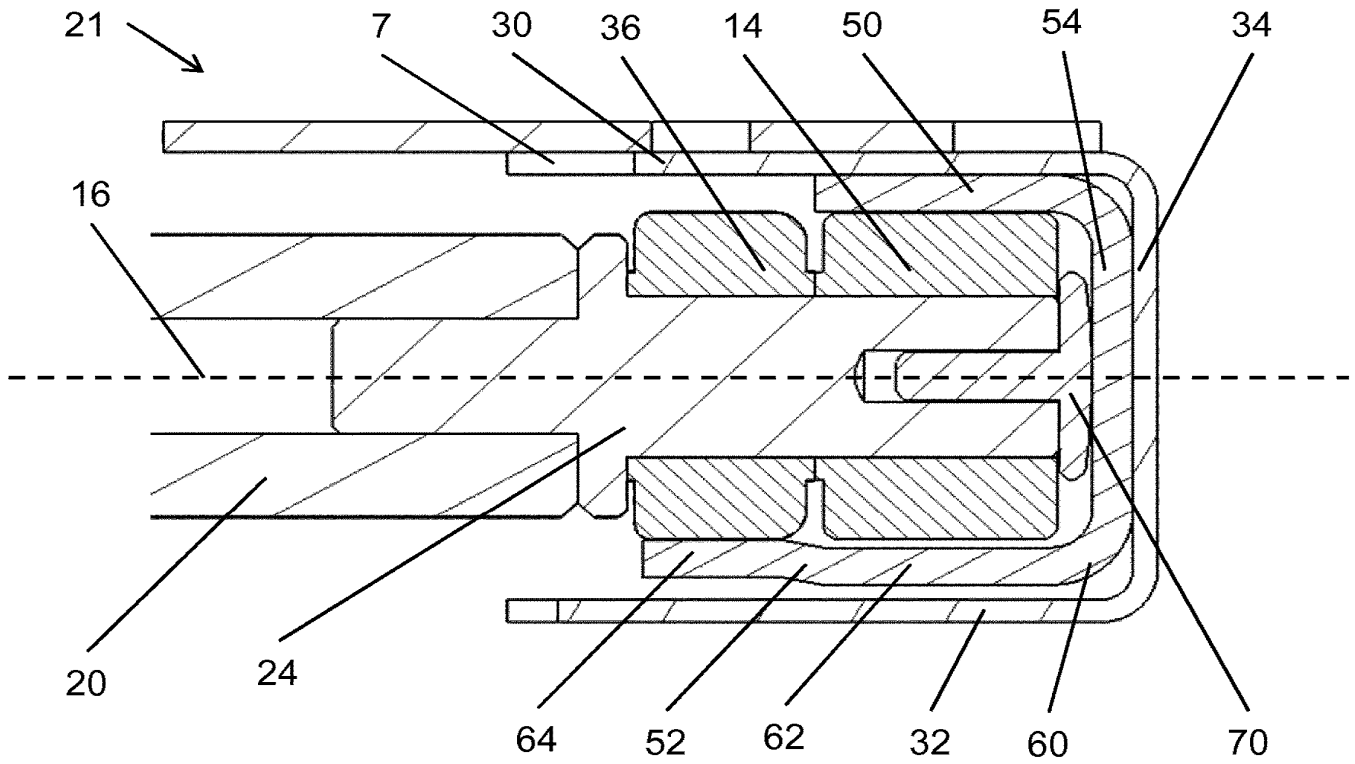

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Fig. 5

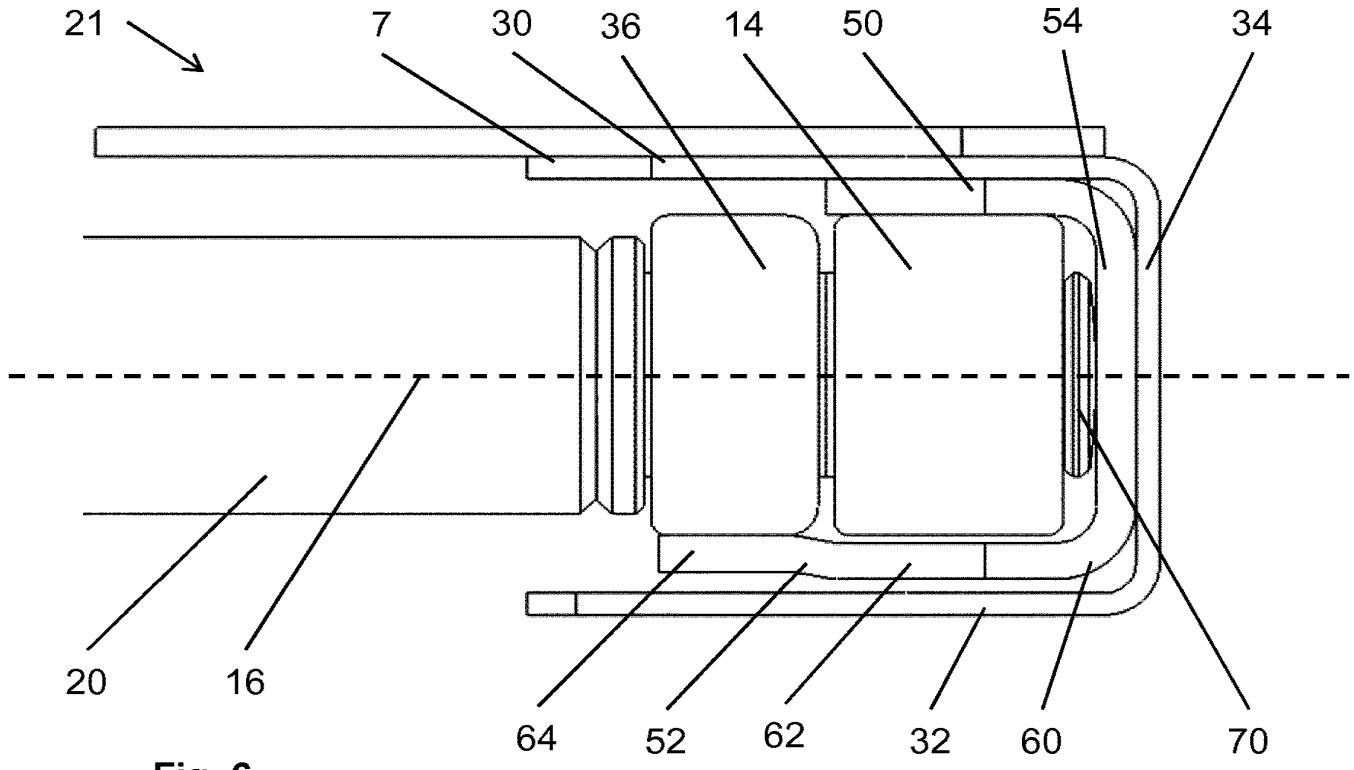

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Fig. 6

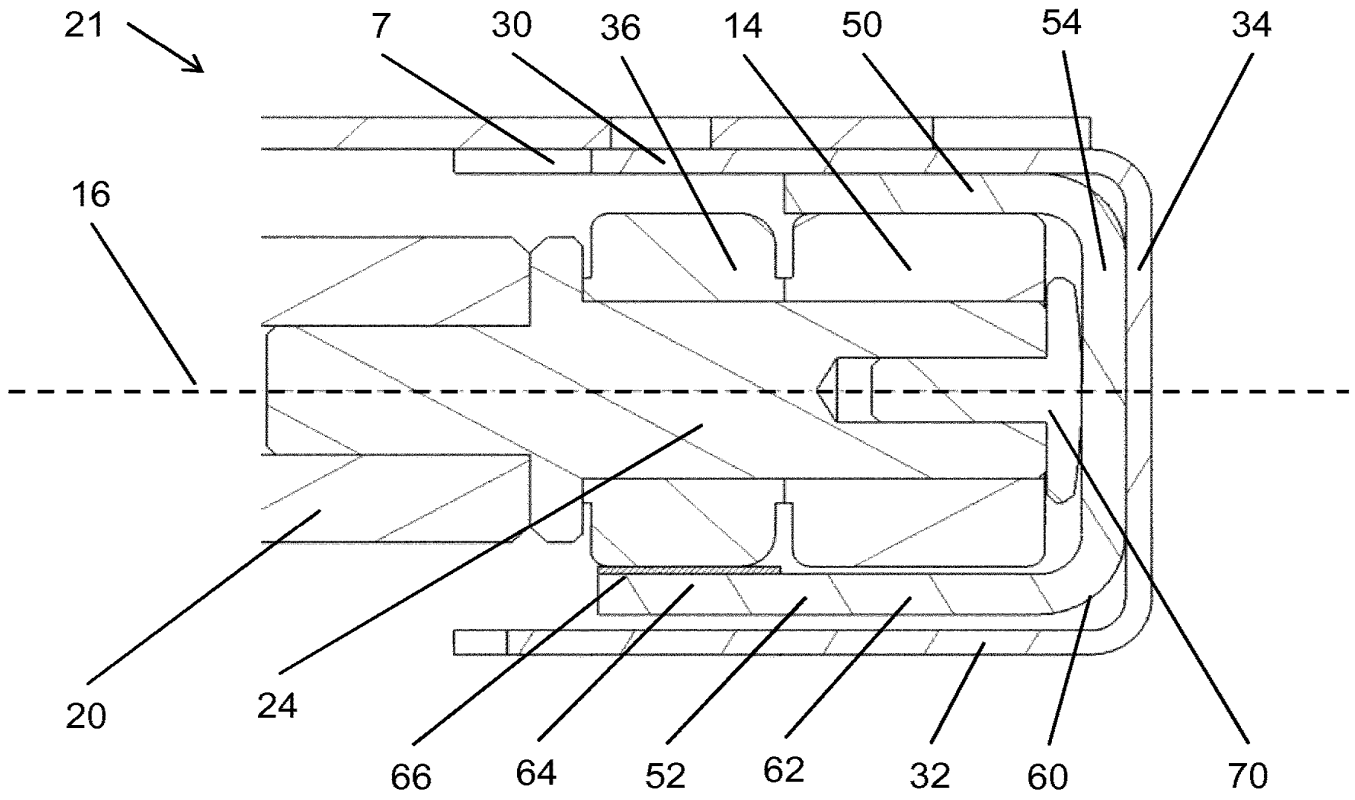

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Fig. 7

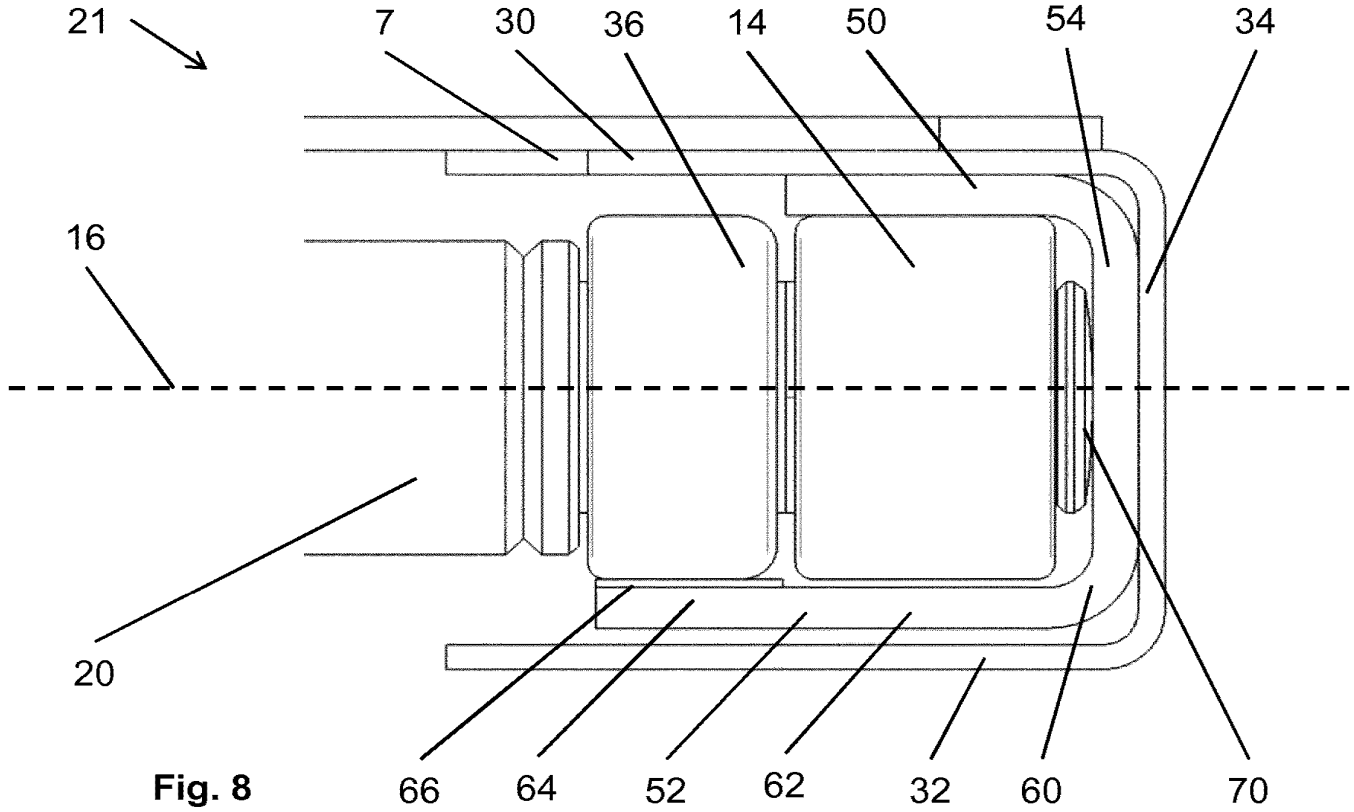

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Fig. 8

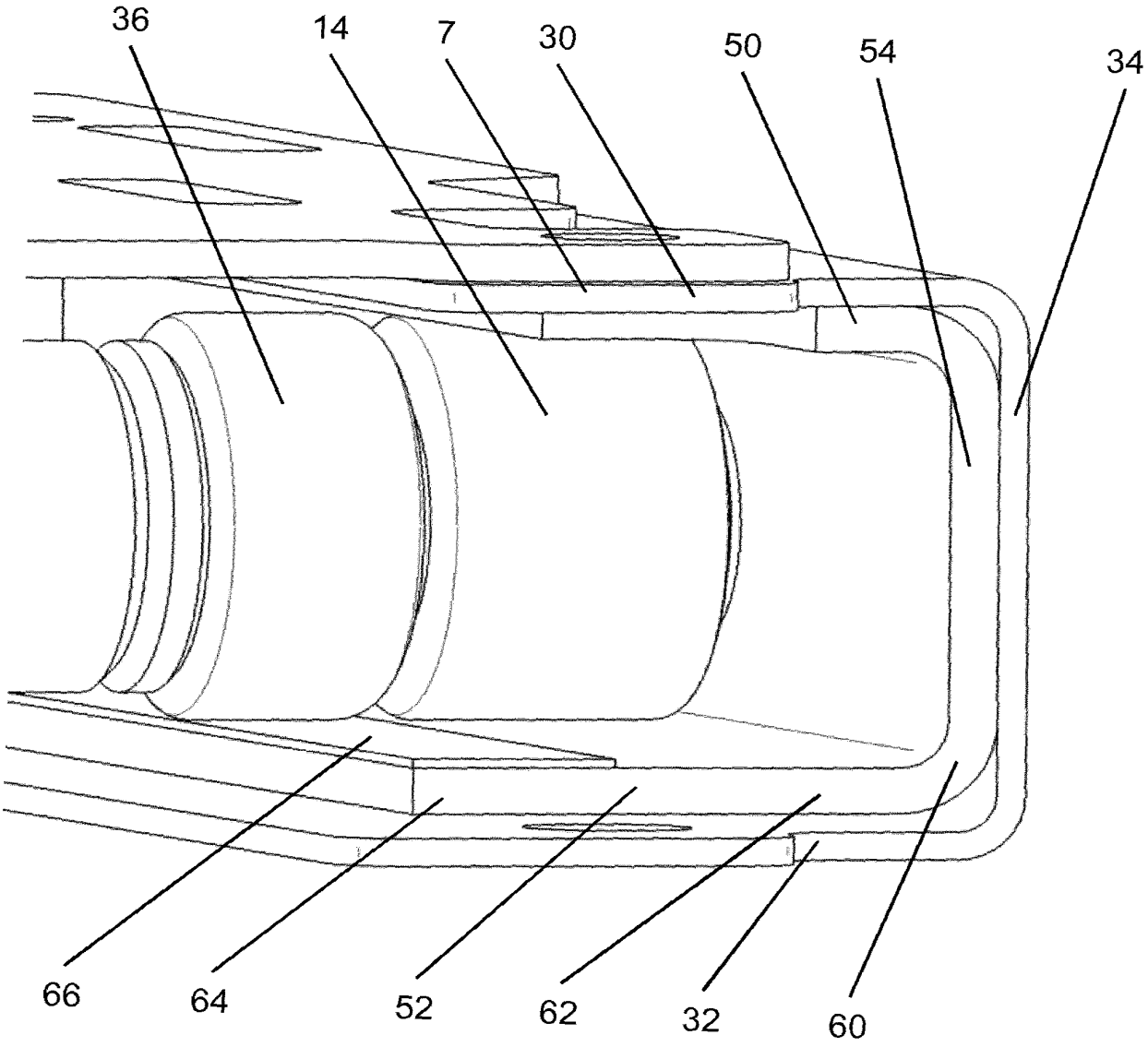


Fig. 9

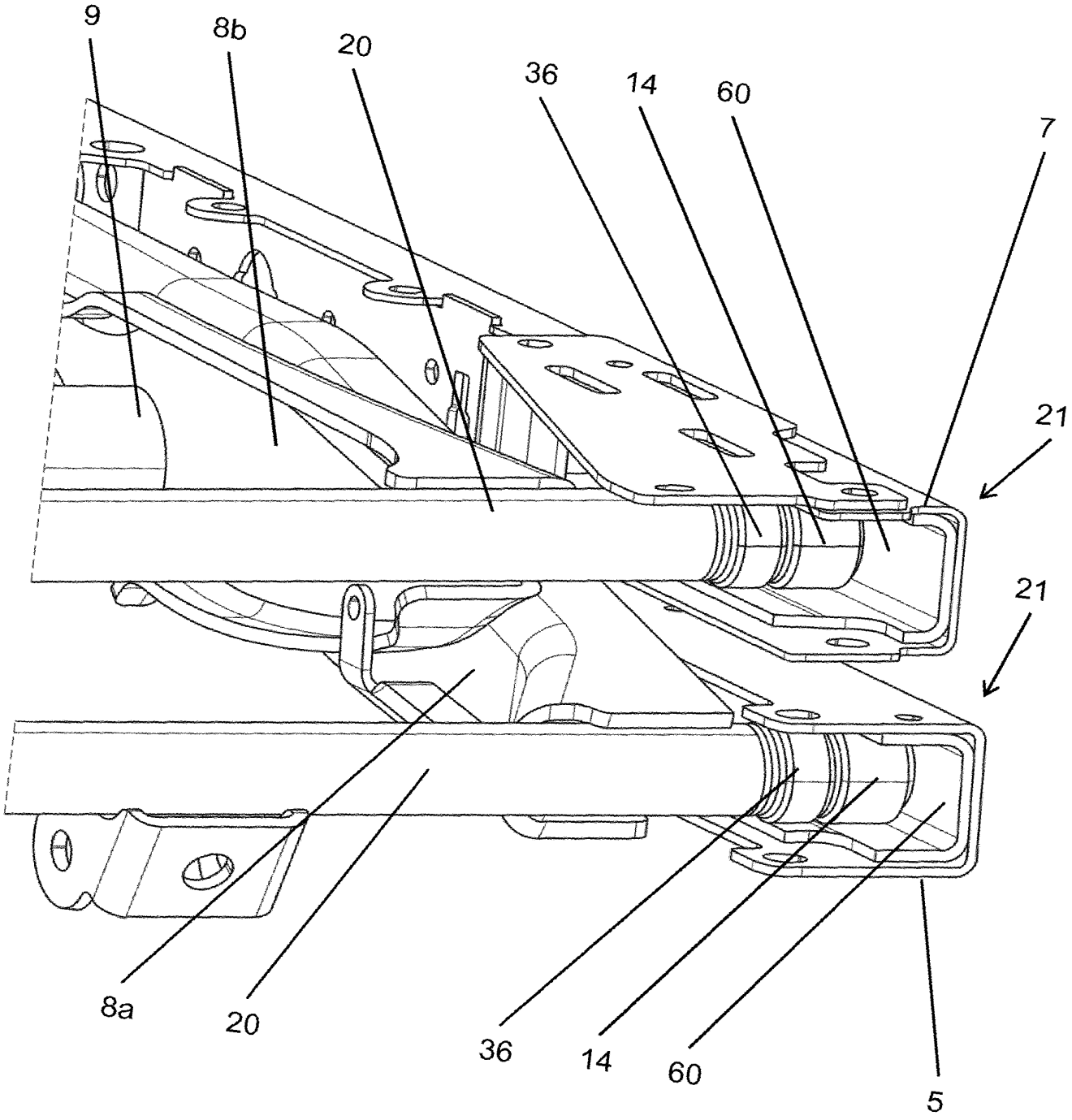


Fig. 10

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2013/066955

A. CLASSIFICATION OF SUBJECT MATTER
INV. B60N2/16 B60N2/50
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B60N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 20 2005 021119 U1 (KEIPER GMBH & CO KG [DE]) 29 March 2007 (2007-03-29) paragraphs [0010] - [0016]; figures	1-10
A	DE 10 2006 059088 B4 (KEIPER GMBH & CO KG [DE]) 18 February 2010 (2010-02-18) the whole document	1-10

☐ Further documents are listed in the continuation of Box C.

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Date of the actual completion of the international search	Date of mailing of the international search report
20 November 2013	28/11/2013

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Jazbec, Simon

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2013/066955

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 202005021119 U1	29-03-2007	NONE	
DE 102006059088 B4	18-02-2010	DE 102006059088 A1	19-06-2008
		EP 2054266 A2	06-05-2009
		RU 2009126429 A	20-01-2011
		US 2010072800 A1	25-03-2010
		WO 2008071322 A2	19-06-2008

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INTERNATIONALER RECHERCHENBERICHT

Internationales Aktenzeichen
PCT/EP2013/066955

A. KLASSIFIZIERUNG DES ANMELDUNGSGEGENSTANDES
INV. B60N2/16 B60N2/50
ADD.

Nach der Internationalen Patentklassifikation (IPC) oder nach der nationalen Klassifikation und der IPC

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C. ALS WESENTLICH ANGESEHENE UNTERLAGEN

Kategorie*	Bezeichnung der Veröffentlichung, soweit erforderlich unter Angabe der in Betracht kommenden Teile	Betr. Anspruch Nr.
A	DE 20 2005 021119 U1 (KEIPER GMBH & CO KG [DE]) 29. März 2007 (2007-03-29) Absätze [0010] - [0016]; Abbildungen -----	1-10
A	DE 10 2006 059088 B4 (KEIPER GMBH & CO KG [DE]) 18. Februar 2010 (2010-02-18) das ganze Dokument -----	1-10

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Datum des Abschlusses der internationalen Recherche	Absendedatum des internationalen Recherchenberichts
20. November 2013	28/11/2013

Name und Postanschrift der Internationalen Recherchenbehörde	Bevollmächtigter Bediensteter
Europäisches Patentamt, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Jazbec, Simon

Formblatt PCT/ISA/210 (Blatt 2) (April 2005)

INTERNATIONALER RECHERCHENBERICHT

Angaben zu Veröffentlichungen, die zur selben Patentfamilie gehören

Internationales Aktenzeichen
PCT/EP2013/066955

Im Recherchenbericht angeführtes Patentdokument	Datum der Veröffentlichung	Mitglied(er) der Patentfamilie	Datum der Veröffentlichung
DE 202005021119 U1	29-03-2007	KEINE	
DE 102006059088 B4	18-02-2010	DE 102006059088 A1	19-06-2008
		EP 2054266 A2	06-05-2009
		RU 2009126429 A	20-01-2011
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		WO 2008071322 A2	19-06-2008

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PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 5 :
A61G 7/005 // A47C 19/04
B66F 3/22

A1

(11) International Publication Number: **WO 91/11979**

(43) International Publication Date: 22 August 1991 (22.08.91)

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(22) International Filing Date: 13 February 1991 (13.02.91)

(30) Priority data:
900688 13 February 1990 (13.02.90) FI

(71) Applicant *(for all designated States except US):* A. AHLSTROM CORPORATION [FI/FI]; SF-29600 Noormarkku (FI).

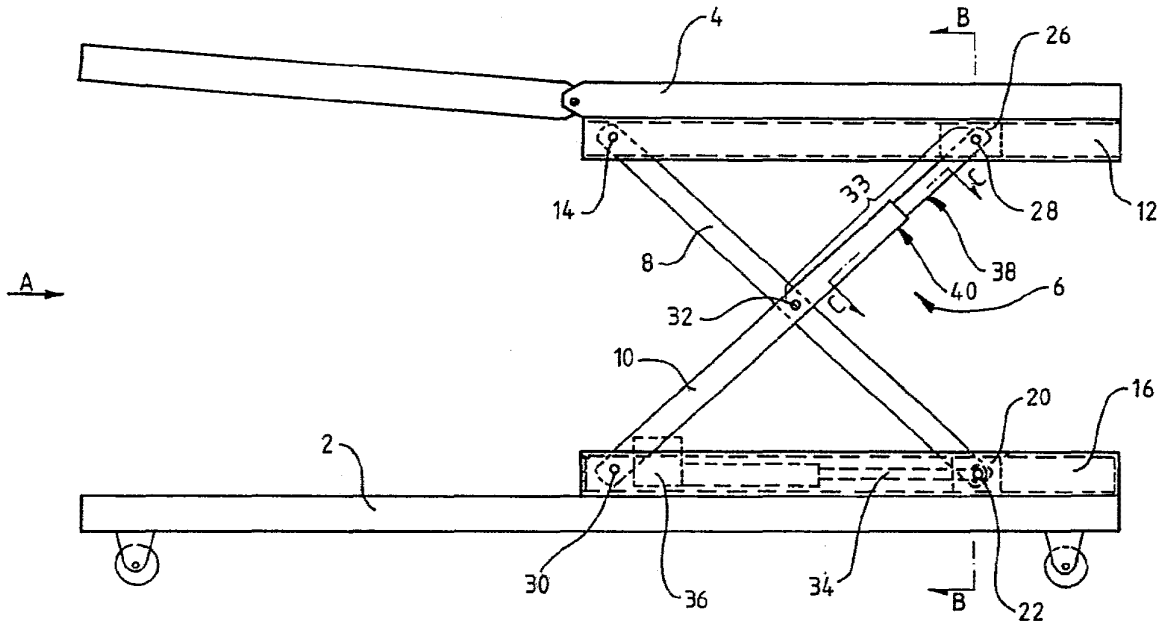
(72) Inventors; and
(75) Inventors/Applicants *(for US only) :* MÄKELÄINEN, Jyrki [FI/FI]; Rinnetie 6, SF-54710 Lemi (FI). NIEMINEN, Matti, O., J. [FI/FI]; Lohiluoma 538/2, SF-27500 Kauttua (FI). OLKKONEN, Kari [FI/FI]; Lohiluoma 539/2, SF-27500 Kauttua (FI).

(74) Agent: A. AHLSTROM CORPORATION; Patent Department, P.O. Box 18, SF-48601 Karhula (FI).

(81) Designated States: AT (European patent), AU, BE (European patent), CA, CH (European patent), DE (European patent), DK (European patent), ES (European patent), FR (European patent), GB (European patent), GR (European patent), IT (European patent), JP, LU (European patent), NL (European patent), NO, SE (European patent), US.

Published
With international search report.

(54) Title: AN APPARATUS FOR INCLINING THE PATIENT-SUPPORTING PORTION OF A HOSPITAL BED



(57) Abstract

The present invention relates to an apparatus for inclining the patient-supporting portion (4) of a raisable and lowerable hospital bed. In a scissors mechanism (6) provided between a body (2) and the patient-supporting portion (4), an arm (33) of one of the two-armed levers (8, 10) is provided with an adjustable pneumatic spring (46) for regulating the length of the arm. For this purpose the lever is formed by an outer tube (40) and by an inner tube (38) disposed slidably therein.

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AN APPARATUS FOR INCLINING THE PATIENT-SUPPORTING PORTION OF A HOSPITAL BED

BACKGROUND OF THE INVENTION

The present invention relates to a bed, a hospital bed in particular, the patient-supporting portion of which can be raised, lowered and inclined.

The patient-supporting portion of modern hospital beds can be lifted up to a higher position which is favourable for the work of the nursing staff and lowered down to a lower position which is convenient for the patient. Further, nursing of the patient may require that the whole patient-supporting portion is inclined in its longitudinal direction to lift the foot end of the bed higher than the head end, or vise versa.

In prior art hospital beds, the lifting and the lowering movement of the patient-supporting portion has been effected by various parallel mechanisms, and the inclining by means disposed between the parallel mechanism and the patient-supporting portion. Combination of the mechanisms has, however, resulted in rather complex structures.

SUMMARY OF THE INVENTION

The object of the invention is to provide a structurally simple apparatus for lifting, lowering and inclining of the patient-supporting portion of a hospital bed or a like bed.

The apparatus according to the invention is mainly characterized in that a scissors mechanism is disposed between the patient-supporting portion and the body, the two-armed levers of the scissors mechanism being

operationally connected to means regulating the length of at least one of the arms.

Preferably at least one of the levers of the scissors mechanism is composed of a pipe slidably disposed inside another pipe and connected to it via a pneumatic spring.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is described in more detail, by way of example, with reference to the accompanying drawings, in which:-

Fig. 1 is a side view of an apparatus according to the invention;

Fig. 2 is an end view of the apparatus of Fig. 1 in the direction A;

Fig. 3 is a section along line B - B of Fig. 1;

Fig. 4 is an enlarged section along line C - C of Fig. 1; and

Fig. 5 is a fragmentary schematic elevation of an alternative embodiment.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

The hospital bed illustrated in Figs. 1 - 4 comprises a body 2 and a patient-supporting portion 4 and a scissors mechanism 6 extending between the body and the patient-supporting portion. The scissors mechanism comprises a central articulated lever 8 crossed and pivotally interconnected with two articulated levers 10 with the crossed two-armed articulated levers 8 and 10 thus arranged the lever 8, located under the center line of the patient-supporting portion supports the underlay at the center area, and the two levers 10 located spaced apart from each other symmetrically on both sides of the lever 8 support the patient-supporting portion at one end area of the underlay. The upper end of the lever 8 is pivotted on a

shaft 14 supported in [-shaped longitudinal bars 12 of the patient-supporting portion, and the lower end on a shaft 22 attached to slides 20 moving in slideways 18 formed by [-shaped bars 16 of the body. The upper ends of the levers 10 are pivotted on a shaft 28 supported in slides 26 moving in slideways 24 formed by [-shaped bars 12 of the patient-supporting portion, and the lower ends on a shaft 30 attached to the [-shaped bar 16 of the body. Further, the levers are interconnected by an articulated joint via a shaft 32 disposed at the crossing point of the levers.

The slides 20 at the lower end of the lever 8 can be moved in the slideways 18 by means of a screw spindle 34, which moves linearly and is functionally connected to the slides and driven by a motor 36. While the slides of the lower end of the lever 8 move the slides 26 of the upper ends of the levers 10 move in their slideways in a corresponding way. When the lower ends of the levers approach each other the patient-supporting portion rises up and when they move away from each other the patient-supporting portion descends. The upper portion of the levers 10 is constituted by a square tube 38 slidably disposed in a square tube 40 serving as the center and the lower portion of the lever 10. At the upper end of the outer tube 40, there are internal slide blocks 42 and at the lower end of the internal tube 38, there are external slide blocks 44 guiding the movement of the tube 38. A pneumatic spring 46 is provided inside the tubes and a piston arm 48 of the spring is connected, via a pin 50, to the inner tube 38. A pneumatic spring cylinder 52 is connected, via a sleeve 54 surrounding said cylinder, to the outer tube 40. In the end of the cylinder, there is a threaded pin 56 connected to a flange 58 in the sleeve. The sleeve 54 is connected to the outer tube via a shaft 60.

The cylinder of the pneumatic spring is formed by an inner tube 62 and an outer tube 64. At the end of the cylinder, there is a valve 66 for changing the position of a piston 68. When the valve is opened a space 70 by the piston and a space 71 by the piston arm communicate with each other and gas can flow from one space to another via a passage 72 between the outer tube and the inner tube and via ducts 74 and 76 at the ends of the cylinder whereby the piston can move. The valve is opened by turning the shaft 60 and an eccentric means 78 connected to said shaft. When the valve is closed the flow of gas is prevented. The pneumatic spring is filled with pressurized gas such as nitrogen and possibly also with oil by a method know per se.

The distance between the shafts 28 and 32 of the levers 10, i.e. the length of the upper arm 33 of the lever is thus easily changeable with the pneumatic spring. When the length of the arm is increased the end of the patient-supporting portion by the extendable upper arm rises up and when the length of the arm is reduced the end of the patient-supporting portion descends. The lifting means is favourably located at the foot end of the patient-supporting portion since the head end of the patient-supporting portion must be separately turnable in different positions.

The thrust of the pneumatic spring is chosen to correspond to the weight of the foot end portion of the patient-supporting portion which ensures balance of the patient-supporting portion and it is equally easy to change the longitudinal inclination of the patient-supporting portion in both directions.

Since, according to the invention, the lifting up and lowering down of the patient-supporting portion takes place by a scissors mechanism, the patient-supporting

portion does not move in longitudinal direction during the lifting or the descending operation.

The lifting and the inclining motion of a hospital bed according to the invention is achieved by a simple lever mechanism.

It is obvious that the pneumatic spring can be replaced by other means effecting a change in the length, e. g. by a screw mechanism as in the alternative embodiment illustrated in Fig. 5. In this embodiment, the length of the lever arms is changed by shifting the crossing point of the levers. A slideway 80 is formed in the lever 8 and a slide 82 movable in the direction of the lever is provided in the slideway. The slide is provided with a shaft 32 to which the levers 10 are journalled. The slide is connected to a screw spindle 84 which moves linearly and is driven by a motor 86. When the slide is moved the lengths of the lever upper arm 88 and the lever lower arm 90 are changed and the upper end of the lever 10 rises and descends whereby the patient-supporting portion is inclined in the desired direction.

Although only a hospital bed is mentioned in the description of the invention it is clear that the same inventive concept can be applied also in other corresponding beds and apparatus.

WE CLAIM:

1. An apparatus for inclining the patient-supporting portion (4) of a hospital bed which hospital bed further comprises a body (2) and adevice for lifting and lowering the patient-supporting portion, **characterized** in that said device comprises a scissors mechanism (6) provided between the body (2) and the patient-supporting portion (4) and the two-armed levers (8, 10) of which scissors mechanism are functionally connected to means (46, 82, 86) controlling the operation of at least one arm (33).

2. An apparatus as claimed in claim 1, **characterized** in that the means (46) controlling the length of the lever (10) is provided in the portion (33) of one lever (10).

3. An apparatus as claimed in claim 1, **characterized** in that the means controlling the length of the arms (88, 90) is disposed in the crossing region to displace the pivot interconnection (32) of the levers (8, 10).

4 An apparatus as claimed in any of the claim 1, 2, or 3, **characterized** in that the means (46) controlling the length of the portion (33) of one lever (10) is an adjustable pneumatic spring.

5. An apparatus as claimed in claim 4, **characterized** in that at least one of the levers (10) of the scissors mechanism (6) comprises a tube (38) which is telescopically disposed inside a second tube (40) and connected thereto via a pneumatic spring (46).

6. An apparatus as claimed in claim 3, **characterized** in that the levers (8, 10) of the scissors mechanism (6) are pivotably interconnected via a means (82) determining the locations of the crossing point (32) of the levers and movable in alignment with one of the levers (8).

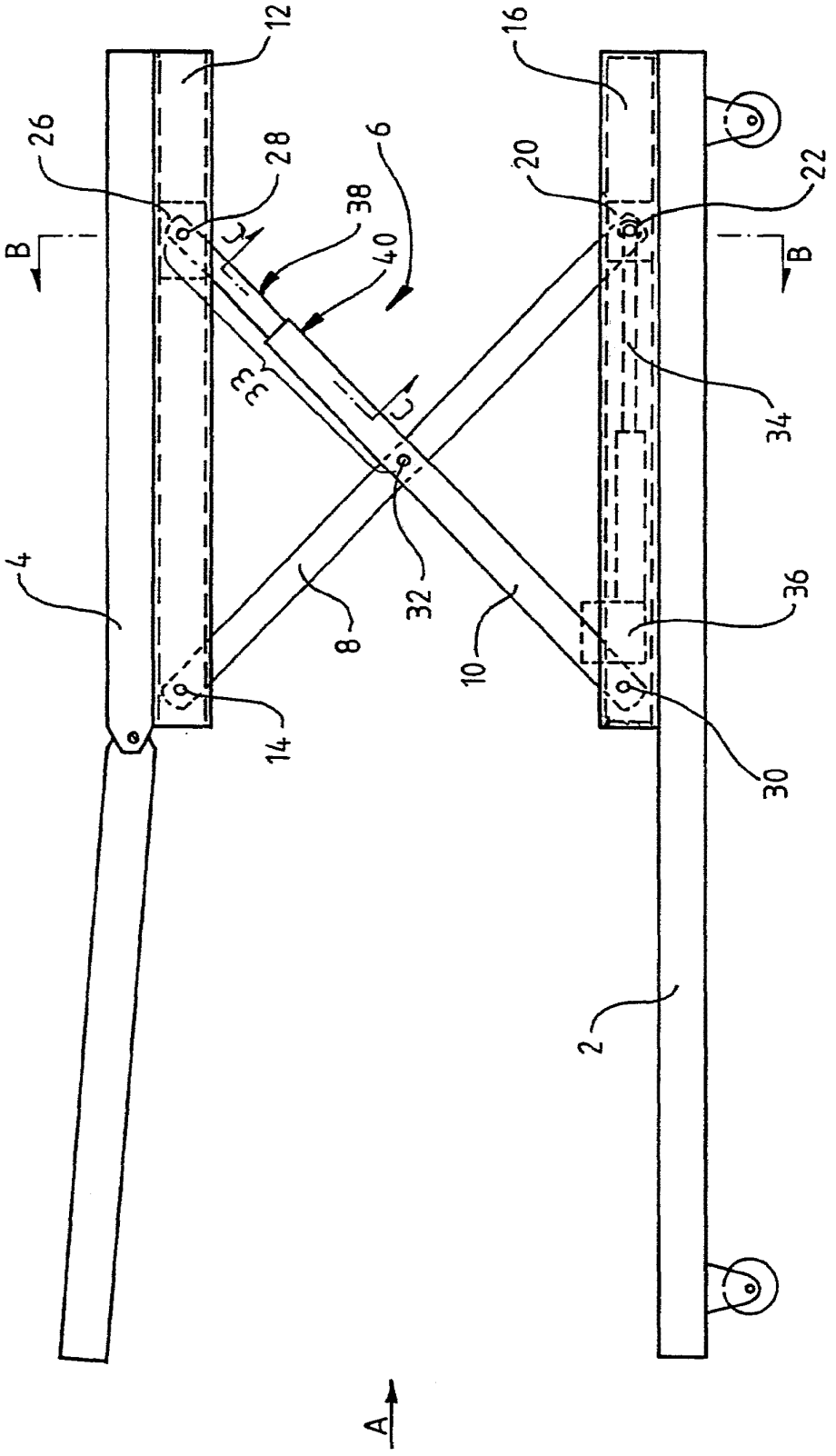


FIG. 1

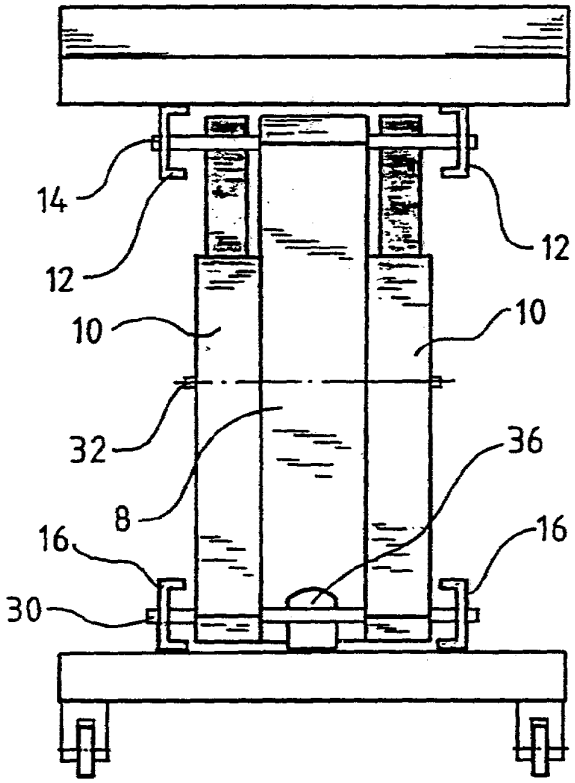

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FIG. 2

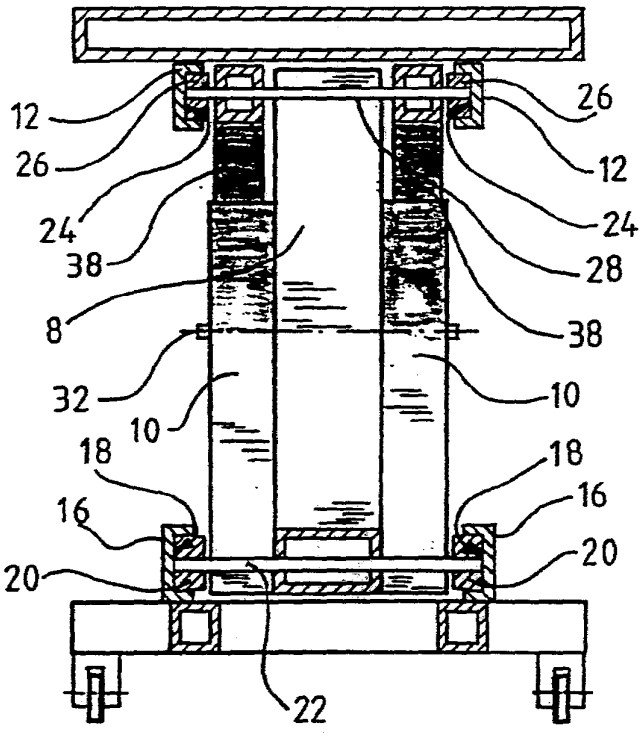

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FIG. 3

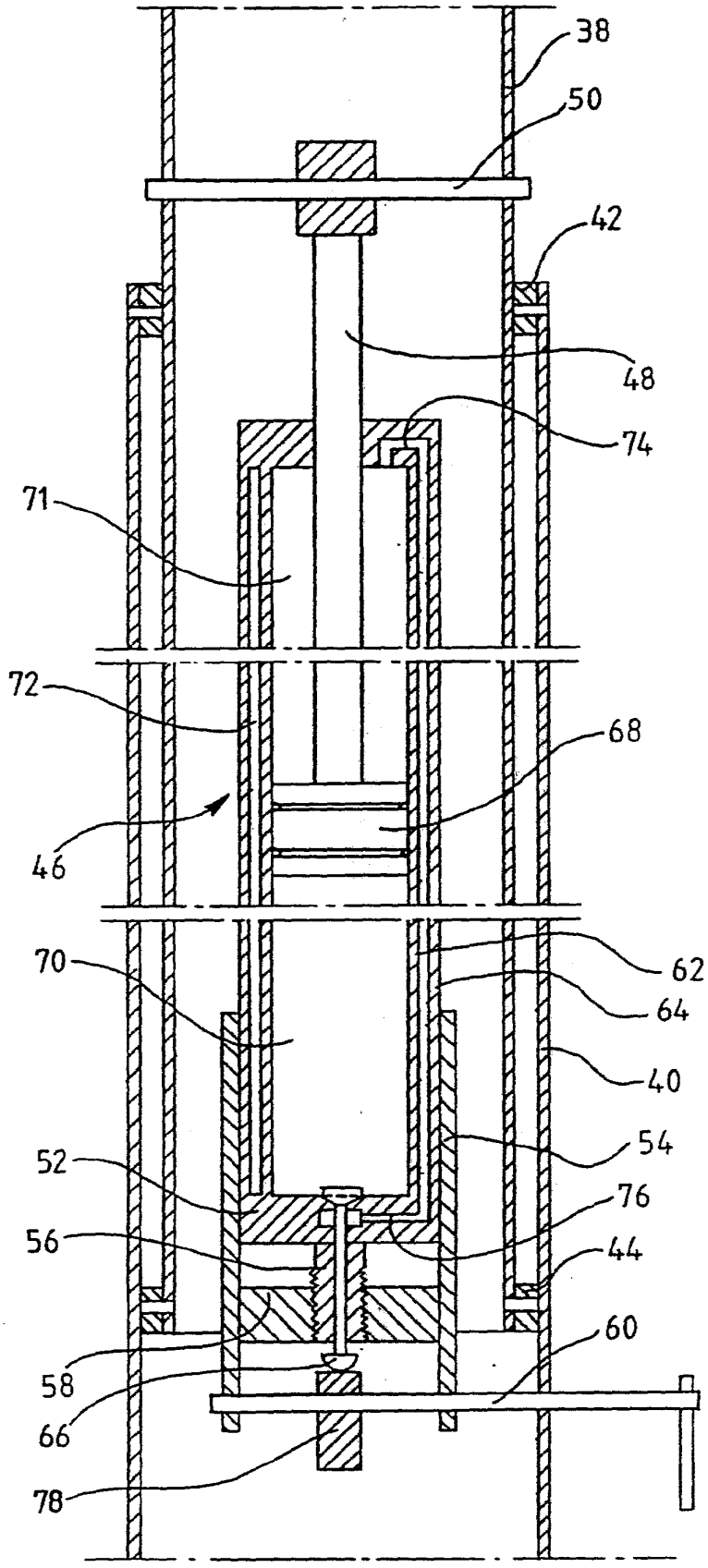


FIG. 4

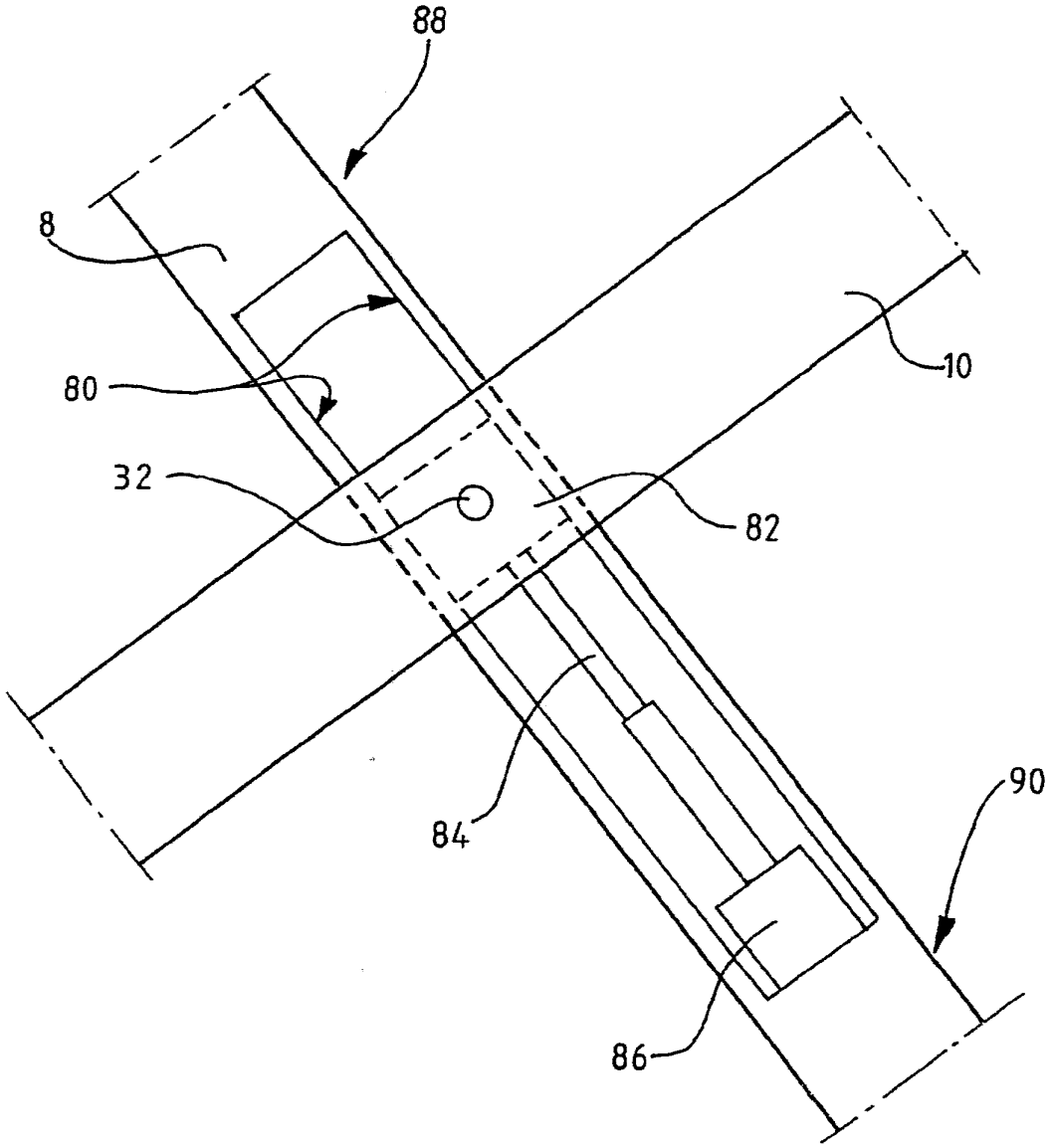


FIG. 5

INTERNATIONAL SEARCH REPORT

International Application No PCT/FI 91/00045

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all)[6]

According to International Patent Classification (IPC) or to both National Classification and IPC

IPC5: A 61 G 7/005//A 47 C 19/04, B 66 F 3/22

II. FIELDS SEARCHED

Minimum Documentation Searched[7]

Classification System	Classification Symbols
IPC5	A 47 C; A 61 G; B 66F

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in Fields Searched[8]

SE,DK,FI,NO classes as above

III. DOCUMENTS CONSIDERED TO BE RELEVANT[9]

Category *	Citation of Document,[11] with indication, where appropriate, of the relevant passages[12]	Relevant to Claim No.[13]
A	Derwent's abstract, No. 87- 5 317/01, SU 1 229 175, publ. week 8701 (VOROSH MACH CONS) --	1-6
A	SE, A, 8306456-8 (AB GEFLE MOTORFABRIK) 24 May 1985, see figure 2 --	1,2,4
A	SE, B, 368145 (LANDSTINGENS INKÖPSCENTRAL, LIC, EKONOMISK FÖRENING) 24 June 1974, see page 4, line 25 - line 31 --	
A	US, A, 3611453 (G.B. LOKKEN) 12 October 1971, see figures 4,5 --	1

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IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
15th April 1991	1991 -05- 02
International Searching Authority	**Signature of Authorized Officer**
SWEDISH PATENT OFFICE	Nils Andersson Nils Andersson

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ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO. PCT/FI 91/00045

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
SE-A- 8306456-8	85-05-24	NONE	
SE-B- 368145	74-06-24	NONE	
US-A- 3611453	71-10-12	NONE	

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(54) Suspension device with cam support member and spring assisted height adjustment

Aufhängungseinrichtung mit einem Nockenunterstützungselement und einer federunterstützten Höhenverstellung

Dispositif de suspension avec un élément de support de came et un réglage en hauteur comprenant un ressort d'assistant

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US-A- 3 339 906
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EP 0 448 340 B1

Description

The present invention relates to suspension systems including seat suspensions with height adjustment such as those typically used in trucks and construction and farming equipment.

EP-A-0 342 779 discloses a suspension system for maintaining two surfaces in variably spaced, generally parallel relation, comprising at least one angularly displaceable support arm with first and second ends; a cam connected by connecting means to said first end of the support arm to effect spacing of the two surfaces, the said cam having a larger arcuate surface and a smaller arcuate surface, the said arcuate surfaces defining a centre point about which the cam pivots as the said arm is angularly displaced; means for securing the said arm and said cam in fixed engagement; means disposed at the second end of the arm for permitting its angular displacement as the spacing between the first said two surfaces changes; and means for connecting the arm and the cam to the one said surface.

With the above described system, as applied for example to a seat adjusting mechanism, the seat can be raised in steps from its lowest position towards its highest usable position. However, it cannot be lowered from any intermediate position, but only by raising it beyond the highest usable position, whereupon it returns automatically to its lowest position.

The present invention aims at permitting a more convenient mode of adjustment and is characterised in that said connecting means (692,783) are adapted to permit angular movement of the cam relative to the support arm, and in that the securing means (695) comprise a latching means which is disengageable to permit the angular adjustment of the cam relative to the support arm and re-engageable to secure the support arm and cam together in different positions of angular adjustment.

With this arrangement, the seat can be lowered from any intermediate position, without first having to raise it above its highest position.

An embodiment of the invention will now be described with reference to the accompanying drawings, of which Figures 1 to 15 inclusive are identical with those of EP-A-0 342 779, and Figures 16 to 22 show a seat adjustment mechanism embodying a suspension system in accordance with the present invention. In the drawings:

FIGURE 1 depicts a driver sitting on a seat attached to the top of a mechanical seat suspension;
FIGURE 2 is a perspective view of a mechanical seat suspension with external parts broken away for better illustration;
FIGURE 3 is an exploded view of the suspension;
FIGURE 4 is a plan view of the mechanical seat suspension;
FIGURE 5 is a side view in partial cross section along line 5-5 of FIG. 4 and shows the seat at its highest adjusted position;
FIGURE 6 is a side view in partial cross section, similar to FIG. 5, showing the mechanical seat suspension in its fully loaded or collapsed position with the imaginary pivot located outside of the device;
FIGURE 7 is a cross section along line 7-7 of FIG. 5 showing the independent scissor arms and support arm inside the housing, with the shock absorber on the outside of one scissor arm;
FIGURE 8 is an exploded view of the support arm showing in greater detail the cam and the height adjustment means;
FIGURE 9 depicts the height adjustment means in an unlatched position;
FIGURE 10 depicts the height adjustment means latched in an intermediate position;
FIGURE 11 shows the height adjustment means reengaged in a first latched position;
FIGURE 12 shows part of an unsatisfactory device in a raised position;
FIGURE 13 shows the unsatisfactory device in an impossibly collapsed position;
FIGURE 14 is a perspective view of a support arm;
FIGURE 15 is a sectional view in elevation of another form of suspension system employing a support arm;
FIGURE 16 is a sectional elevation view of spring assisted height adjustment mechanism in the low, unlatched position, in accordance with the present invention;
FIGURE 17 is a cross sectional view of the height adjustment mechanism of Fig. 16 in its highest, unlatched position;
FIGURE 18 is a cross sectional elevation view of the same height adjustment mechanism in its latched position;
FIGURE 19 is a perspective view of the seat suspension showing the parts of the spring assisted height adjustment mechanism;
FIGURE 20 is a perspective view showing the relationship between a support arm and cam with latch notches and latch pins;
FIGURE 21 is a sectional view of the disengagement roller and roller plate taken through Section 21 of FIG. 17; and
FIGURE 22 is a plan view of the seat suspension and height adjustment mechanism of Fig. 16 viewed from the lower housing toward the upper housing.

Detailed Description Of The Preferred Embodiment

Figure 1 generally depicts a mechanical seat suspension device 1. The device 1 is secured to a surface 2 in a vehicle (not shown) and can be covered by a seat 3 with pads or springs. The driver 4 sits upon the seat 3.

A general perspective of the suspension is shown in FIG. 2, while an exploded view of the device 1 is depicted in FIG. 3. Preliminarily the larger constituent parts of the device 1 will be discussed, after which the individual

pieces will be examined in detail, and then the method of operation of the device 1 will be explained.

The housing for the device 1 consists of a lower portion 10 and upper portion 20. In this instance each portion is a solid plate with transversely bent or welded edges; however, a substantial framelike structure would also perform satisfactorily. Connected to the housing are parallel pairs of scissor arms 35, each pair being denoted 35A and 35B respectively. One end of the scissor arms 35 is connected to the upper and lower housings 10, 20 by shaft bearing tubes 36 and 38 welded to scissor arms 35. Threaded shafts 42 and 44 pass through holes 43 at the ends of lower and upper housings 10, 20 and the bearing tubes 36, 38. These shafts are secured at one end by nuts 46 (one shown) placed outside the housing.

The other end of scissor arms 35 are welded to rods 37 and 39. These rods 37, 39 are covered by nylon roller tips 40 that roll in channels 12 and 22 of the lower and upper housings 10 and 20 respectively.

It can be seen from this configuration that the larger components of the device can be easily disassembled from a complete structure. By removing the nuts 46 from the ends of the threaded shafts 42 and 44, and then pulling the shafts 42, 44 free, the device will separate into the lower and upper housings 10, 20 and the scissor arms 35.

Other preferred features include ears 13 for attaching the upper housing 20 to a seat 3, and holes 14 for securing the lower housing 10 to a surface 2 in a vehicle. Also attached to the scissor arms 35 is the damping means, such as shock absorber 25. A dog 26 is welded to one of the scissor arms. Rod 27, attached to dog 26, passes though a journal 28 at one end of shock absorber 25 (Fig.3). The other journal 28 of shock absorber 25 is pivotally engaged with rod 39 (FIG. 7). The journal ends 28 can be frictionally isolated from the scissor arm 35 by nylon or rubber washers 29 (FIG. 2).

When only the scissor arms 35 and the housings 10, 20 are assembled, there is no force to keep the upper and lower housings 20, 10 spaced apart, and thus without the shock absorber 25, just these pieces would collapse under their own weight. That is to say, there is no horizontal force opposing roller tips 40 from sliding in channels 12, 22. In the assembled device 1, housings 10, 20 are connected to and spaced apart by a support arm assembly generally indicated as 60. One end of the support arm 60 pivots in brackets 70 on the underside of upper housing 20 and is connected to suspension means including springs 90. The other end of the support arm assembly 60 is welded to a transverse rod 62 with nylon end tips 64. These end tips 64 roll in channels 65 composed of steel plates welded to lower housing 10.

The support arm assembly 60 is preferably comprised of two separate pieces 60A and 60B as shown in Fig. 8. The curved end of the support arm assembly 60 fits between brackets 70. A spring shaft 92 passes through bracket slots 72 and support arm slots 66. One set of ends of springs 90 is operatively connected to spring shaft 92. The other ends of springs 90 are ultimately secured against movement by indirect connection to the upper housing 20.

The general concept depicted thus far establishes the independent mechanical operation of the support arm 60 and the scissor arms 35. The support arm assembly 60 ultimately engages the suspension means, springs 90. The scissor arms independently interact with the damping means, shock absorber 25. When a load is placed on the device 1, the rounded ends 61 of support arm assembly 60 roll or pivot against cam followers 120 and 122 secured in bracket 70, thus pulling on suspension springs 90. Simultaneously the motion of the springs 90 are damped by shock absorber 25.

Thus the pivoting support arm 60 is the primary support means of the device. The scissor arms 35 are a secondary support means that function mostly as a guide means for the vertical motion of the upper housing 20. A structural analysis of the entire assembly when loaded would disclose that the scissor arms 35 do transmit some vertical and horizontal components of force, but those components are relatively small in comparison with the load sustained by the support arm assembly 60. Consequently, the scissor arms can be constructed of a less substantial and less costly amount of material than prior art devices.

The support arm assembly 60 is shown in exploded view in Fig. 8. The assembly comprises the elements necessary to interact with the suspension means and the elements making up the means to adjust the height of the device 1. Cam 80 fits between pieces 60A and 60B. Spring shaft 92 passes through slots 66, pieces 60A and 60B, and hole 81 in cam 80 to secure one end of cam 80 inside the support arm 60. Pin 83 passes through slots 67 in pieces 60A and 60B and cam hole 82. Biasing spring 85 is pinned (not shown) through the coil 87 of spring 85 between pieces 60A and 60B with spring angle 86 fitting in notch 69. Pawl 95 is secured between 60A and 60B by pin 96 (Fig. 9) through holes 97A, 97B.

On each outer side of support arm 60, spring end rollers 100 with circular notch 102 fit over each end of spring shaft 92 (FIG. 3). The rollers 100 are secured to the two ends of the shaft 92 by locking pins 104 (one shown). Springs 90 have curved ends 90A that fit in notch 102 (Fig. 4 in plan view). The ends of springs 90 connected to spring shaft 92 are moveable, as will be explained below. The fixed ends of springs 90 are curved ends 90A that loop over bar 110 that is part of the suspension spring adjustment mechanism.

As shown in FIG. 3, the spring adjustment mechanism consists of a threaded rod 112 threaded coupled to bar 110. The rod 112 extends through an aligning hole (not shown) in the upper housing 20. One end of the rod 112 is secured to a knob 114 outside of upper housing while the other end is threadably secured by washer 117 and nut 118 to plate 116 that abuts brackets 70. Consequently, when knob 114 turns threaded rod 112, bar 110 moves toward knob 114 or toward brackets 70. This adjusts the tension on springs 90. The force in the

springs is ultimately transmitted to upper housing 20 by rod 112 and plate 116.

The functioning of the suspension system and its interaction with support arm 60 will now be described. One of the principal features of the device 1 is a so-called imaginary pivot that is the center of two concentric circles defined by arcuate surfaces 80A and 80B of cam 80 (Fig. 9). These surfaces are always in contact with cylindrical cam followers 120 and 122 that are secured inside brackets 70 (FIG. 3). Each cam follower is rotatable about a fixed axis. Referring to Figs. 5-7, when a vertical force A is applied to the upper housing 20, the entire support arm assembly moves in a predetermined manner. Rollers 64 slide to the right (Fig. 5) in slots 65 (Fig. 7) and the left side of the support arm 60 and the cam 80 pivot counterclockwise (Fig.5). This movement occurs because cam followers 120 and 122 are fixed relative to the position of brackets 70 and upper housing 20. Because springs 90 are connected to spring shaft 92, and fixed relative to upper housing 20 by bar 110, springs 90 pull the cam 80 and the cam end of support arm 60 to the right. The downward movement of the upper housing 20, however, causes a counterclockwise rotation to the cam 80 in opposition to force A. As the cam 80 moves, so too does the imaginary pivot move vertically through space.

A comparison of Figures 5 and 6 demonstrates the circular movement of the cam 80 relative to the fixed locations of cam followers 120, 122. From the highest adjustment of the device 1 as shown in Fig. 5, force A has caused the cam 80 to rotate counterclockwise to the device's lowest position in Fig. 6. At the same time, roller 64 of support arm 60 has moved further to the right, thus permitting the compression of the device 1. It should also be noted that slots 72 in brackets 70 define the same concentric arc as do cam surfaces 80A and 80B moving against cam followers 120, 122. Thus, spring shaft 92 follows the same arcuate motion of the cam 80. It should be noted that Figures 5 and 6 represent two different height adjustments of the device 1. As will become clear below, the height adjustment mechanism of the seat does not change when the device 1 is loaded. Figures 5 and 6 simply represent the two extreme configurations of the seat suspension.

Figure 6 depicts the so-called imaginary pivot, which is defined by the intersecting radii of the arcs defined by cam surfaces 80A and 80B. The pivot is not fixed, except with respect to the upper housing 20, and its location varies with the vertical movement of cam 80 and upper housing 20. As can be seen from Fig. 6, the imaginary pivot can be located outside the body of the device 1. This feature is responsible for the compactness of the mechanism. In the present embodiment, the collapsed height in Fig. 6 is 3 inches (76mm), while the full height in Fig. 7 is approximately 9 inches (229mm).

Figures 12 and 13 show how a traditional configuration would require a greater height for the same device. To duplicate the performance of the present mechanism would require a scissor 330 with a force lever arm from pivot 300 to a point 310 collinear with spring 320. With this mechanical arrangement of Fig. 12, the completely collapsed configuration of Fig. 6 could not be achieved. This is demonstrated in Fig. 13, where the actual height H would be 5 inches (126mm), thus making it impossible to bring together upper and lower housings 20,10. The few inches (mm) saved in the height of a mechanical seat suspension can mean the difference between meeting and not meeting the dimensional tolerances established by the equipment manufacturers who purchase such suspension devices. Traditionally the suspension of a device is determined by the lever ratio, which represents the vertical displacement of the upper housing relative to the movement of the suspension spring. In the illustrated mechanism, the radii of curvature of the cam surfaces 80A and 80B are a result of the seat designer's predetermined choice of a lever ratio, which in the present device is 3:1.

The independence of the support arm 60 from shock absorber 25 not only permits a more efficient operation of each item, it also permits a generally constant linear relationship between the vertical travel of the upper housing 20 and shock absorber 25. This linearity results in a uniformity of performance of the seat, regardless of its load or height adjustment. The preferred ratio for the travel of the seat suspension to the stroke travel of the damping means is approximately 3.

The linear relationship between the upper housing 20 and the shock absorber 25 should not vary from complete linearity by more than 10 percent. This is because the two ends of the shock absorber move in a substantially linear relationship to each other as the scissor arms move. In the prior art devices, the shock absorber would be attached to the upper and lower housings. This would result in arcuate, non-linear motion, and thus the vertical component of the force applied to the shock absorber would diminish as the vertical height of the suspension decreased. Here the force in the shock absorber 25 is independent (within 10 percent) of the height of the seat, and is determined only by the load on the seat.

The height of the dog 26 determines the length of stroke of the shock absorber 25. A maximum amount of stroke for the shock is desirable. The further away from the scissor arms pivot 35C the rod 27 is, the greater will be the stroke of the shock absorber 25. This in turn will lower the ratio between the displacement of the upper housing 20 and the shock 25. One of ordinary skill in the art will appreciate that it is not necessary for the lever ratio and shock ratio to be identical, and that such features are a result of the design requirements for a particular suspension device.

Figures 9, 10, and 11 depict the operation of the height adjustment means. In general, biasing spring 85 urges pawl 95 into locked engagement with one of a plurality of notches 150 on cam 80. The notches 150 are defined by a plurality of teeth 152 and pawl engaging tooth 154. The described mechanism uses three notches, each representing a different height adjustment. Fewer or more notches can be used, and the dis-

closure of three height adjustments is merely by way of example.

Fig. 10 depicts the adjustment means at its intermediate height. Arrow X designates the force of springs 90 which, coupled with the biasing force from spring 85, maintains the tip of pawl 95 engaged with notch 150. To raise the height of the device 1 requires the application of a vertical force Y on spring shaft 92, which can be accomplished by an upward force exerted on upper housing 20 (not shown). This causes support arm 60 to pivot clockwise. Rollers 64 in channels 65 move to the left while the vertical force Y pulls the support arm 60 and cam 80 upward. This releases the locking force engaging pawl 95 and notch 150 so that as cam 80 is pulled upward pawl 95 slides over the tip of tooth 151 and into the adjacent right hand notch 150A (Fig. 10).

In the described mechanism, notch 150A represents the highest height adjustment. To lower the height of the device 1, additional vertical force is applied to the support arm 60 and cam 80 until pawl disengaging edge 195 contacts cam disengaging edge 180. As more upward force is applied pawl 95 pivots about pin 96. Thus the tip 295 of pawl 95 that contacts spring 85 moves from the tip 185 of spring 85 into notch 285. The tip of pawl 95 that engages notches 150 is moved beyond the arc that circumscribes teeth 151, and the height adjustment means is completely disengaged.

Reengagement of the height adjustment means requires a downward force to be applied to support arm 60 and cam 80. This is done by pushing down on the upper housing 20 (not shown Figs. 9-11), which rotates the support arm 60 counterclockwise as rollers 64 move to the right. This motion eventually causes the tip of pawl 95 to contact pawl engaging tooth 154, which is larger than teeth 151. When contact is first made tip 295 is still held in notch 285. Further downward force causes pawl 95 to pivot about pin 96 so pawl tip 295 is relocated to spring tip 185. This arrangement is depicted in Fig. 11, which shows the height adjustment means engaged in its first, or lowest, position.

It is important to note that the geometry of the biasing spring 85 and pawl 95 has a special configuration and purpose. When the height adjustment means is in any of the three positions, or anywhere in between, rear pawl tip 295 is always located at biasing spring tip 185 and being urged into engagement with notches 150. When the pawl 95 has become completely disengaged, as shown in Fig. 9, notch 285 urges pivotable pawl 95 to remain in continual disengagement, outside the arc of teeth 151, until reengaging tooth 154 engages pawl 95 into the first position. The detent means of pawl disengaging edge 195 and cam disengaging edge 180, by causing the rotation of the pawl 95, locates the pawl tip 295 with respect to spring tip 185 or spring notch 285.

Figure 14 is a perspective view of a simplified support arm 560 similar in concept to the support assembly 60 described above. Because no height adjustment mechanism is incorporated into the arm, it can be made as a single structural element. The support arm 560 includes a shaft 562. At one end of the shaft is cam 580, with a larger arcuate surface 561 and a smaller arcuate surface 566. The arcuate surfaces define a center point C as depicted by the intersection of radii r_1 and r_2 in FIG. 15. At the opposite end of shaft 562 from cam 580 is a means 564 for permitting angular displacement of the support arm. Such means could consist merely of a solid rod 564 as shown in FIG. 14, which would slide on a surface. Alternatively the means for permitting angular displacement could be similar to the rollers 64 that slide in channels 65, as described earlier. Various other equivalents of the means for permitting angular displacement can easily be substituted. For example, the end of shaft 562 could merely be rounded for smooth sliding on a surface or could be a roller. The movement of the means 564 is generally parallel to the two surfaces being supported.

A means for operatively connecting the support arm 560 to the remainder of the suspension system can be accomplished in a variety of ways. Rod 592 can be secured to one end of a spring 500 as shown in FIG. 15. Other fastening equivalents such as slots, nuts, bolts, weldments, and the like are equally acceptable.

A practical but simplified version of a suspension system using the support arm 560 is depicted in FIG. 15. No height adjustment mechanism, scissor arms, or linear damping feature is present, although it is contemplated that any one or more of those elements could be added. Instead of scissor arms, the stability of plate 520 is ensured by rod 540 that travels in a pair of brackets with parallel slots 545 (one shown), which in turn is secured to surface 547. Alternatively, stability of the support arm and the suspension system can be assured by a pair of plates 570, which function similarly to brackets 70 disclosed above. Other means of stabilizing the suspension system are also contemplated, such as the above referenced rollers 64 and channels 65 or the use of two parallel support arms (not shown).

Suspension spring 500 provides a biasing force to the system by resisting the rotation of support arm 560 as the cam follower means 522 and 523 guide the movement of cam 580. In this way the support arm functions essentially as described in the more complex system. The spring 500, of course, can be fixed at one end 501 in various ways, such as through tab 510 attached to plate 520. It is also contemplated that the biasing means could alternatively comprise other hydraulic or mechanical devices, well known to those of skill in the art.

In FIG. 15 damping means 525 is a shock absorber shown in phantom whose location permits the depicted suspension system to collapse in much the same way as shown in FIG. 6. Depending upon the desired motion and force characteristics, as well as the dimensional and cost constraints, shock absorber 525 could be eliminated; or, it could be relocated to a vertical position between plate 520 and bottom surface 530 or other desirable positions.

As shown in FIG. 15, the simplified suspension system requires only one moveable surface or plate 520. Surface 530 could be a parallel element of the system,

such as lower housing 10 described above, or it could simply be the flat floor of an operator's cab. Similarly, the suspension systems illustrated in the drawings can even be oriented 90 degrees to, for example, provide back support for a seat.

A preferred embodiment of the present invention is shown in Figs. 16-22. It includes a support assembly with a spring assisted height adjustment mechanism. The support assembly itself, when latched in an adjusted position, operates as previously described. (See, e.g., support arms 60A and 60B and cam 80 in FIG. 8, and FIG.'s 5 and 6 depicting the operation). The suspension system includes a second support surface or lower housing 610 and a first support surface or upper housing 620. Extensions support springs 690 are connected at one end to the upper housing and at the other end to a spring shaft 692 that is operatively connected to the support arm assembly 660 and support cam 680. The movement of the cam 680 is determined by curved surfaces on the cam that remain in contact with cam followers 720 and 722. Two pairs of scissor arms 635 guide the motion of the suspension system and receive some of the force generated by weight applied to the top of the upper housing. The bottom of the support arm assembly has a roller assembly 664 that moves along the surface of the lower housing. Other similar features previously described also are incorporated in this embodiment, such as the spinner knob spring adjustment 614 used to control the tension in extension spring 690 that controls the suspension. A shock absorber 625, such as a three-way adjustable Gabriel shock absorber, eliminates damping. The present suspension also contemplates certain improvements, such as bracket extension plates 670A (FIG. 22). These are used to distribute the force from the suspension springs. In the mechanism depicted in FIG. 3, it was discovered that stress concentrated in the area of brackets 70 where they connected to threaded rod 112. The extension plates 670A have eliminated some of this stress concentration.

A clear view of the elements of the spring assisted height adjustment mechanism is depicted in the perspective view of FIG. 19. Pulling up on height adjustment handle 700 turns height adjustment rod 702, which moves a pair of disengagement drive arms 704 in the direction of arrow A. The disengagement arms have a slot 706 so that they can move freely without being obstructed by cam follower 722 which is secured to brackets 670 in a manner described earlier. Cam follower 722 rotates about an axis but does not move relative to bracket 670, which is why slots 706 are provided for the movement of disengagement arms 704. At the end of the disengagement arms is disengagement roller assembly 708, which is made up of three separate rollers, two of which contact the support arms 660 and the other of which engages roller plate 710 and is aligned with cam 680 (see FIG. 21). Spring shaft 692 is operatively connected to support extension springs 690, and also connected to the end of height adjustment spring guide 732. Spring guide 732 assures the linear movement of height adjustment compression spring 730 which exerts a force as denoted by arrow C, FIG. 19. Between the pair of springs and spring guides is the support arm assembly which includes support arms 660A and 660B and cam 680. These parts are also connected to spring shaft 692. Shaft 692 passes through slot 666 in the support arms and through hole 682 in cam 680. Spring shaft 692 passes through a curved slot (not shown) in brackets 670 similar to the slot 72 depicted in FIG. 3. Support members 660A and 660B are connected by pins 695 that pass through holes 697 and cam slot 751. Spring shaft 692 also maintains the support arms and cam 680 in the configurations depicted in FIGS. 16-19. Guide pin 783 posses through hole 667 and slot 681.

The spring assisted height adjustment mechanism operates as follows. When height adjustment handle 700 is actuated to move disengagement drive arms in the direction of arrow A, the large center roller of disengagement roller assembly 708 encounters roller plate 710 which transfers the thrust of the disengagement arms through the outside rollers of disengagement assembly 708 to push downward on the top of support arms 660. As the top of the support arms move downward, pins 695 move downward also, thus unlatching the pins from latching slots 750 and latching teeth 752. While the support arms 660 move, cam 680 remains stationary, because extension springs 690 are continually pulling spring shaft 692 in the direction of arrow B (FIG. 16). The force in the extension support springs 690 is typically many times greater than the force in height adjustment compression springs 730. When the cam rollers disengage the support arms 660 from cam 680, height adjustment compression springs 730 exert a force as denoted by arrow C. The vertical component of the force in the adjustment spring causes the spring guide to rotate in the direction of arrow R. The linear component of the extension force is resisted by the much stronger support extension springs 690. As the support arms 660, connected in part by pins 695, rotate and extend upward, support springs 690 urge the support members and pins back into reengagement with latch slots 750. Thus, the system is randomly adjustable, based on whether the upper housing 620 is bearing any weight, and if so, how much. The use of two small pins 695 permits a more even distribution of the force in spring 690, so that teeth 752 and slots 750 in cam 680 can be machined to smaller dimensions, thus permitting a greater number of seat adjustment positions.

The spring assisted height adjustment mechanism possesses certain preferred features. For example, the disengagement rollers 708 are different sizes, as depicted in FIG. 21. If the rollers were the same size, the two outside rollers would engage the support arms 660 first. This would cause binding, scuffing, and wear of the two outside rollers. As depicted in FIG. 17, the upper surface of cam 680 is recessed below the curved surface of support arm 660 so that the smaller rollers will engage the support members before the larger roller engages the cam 680. Another preferred feature is for the curved

surfaces of cam 680 that engage cam followers 720 and 722 to extend slightly beyond the curved edges of support members 680. In this manner, the cam followers wear less and therefore possess a longer life if they contact only the hardened, smooth surface of the cam. The cam is dimensioned more precisely than the support members. Therefore, if the support members were also contacting the cam followers, the imperfections in the curved surfaces of the support members would be transmitted through the suspension system to the driver, making for a very uncomfortable ride. Lock out plate 731 with tooth 731A (FIG. 22) is placed so that the tooth will stop rotation of cam 680 and only support arms 660 will move during the height adjustment operation.

Claims

1. A suspension system for maintaining two surfaces (610,620) in variably spaced, generally parallel relation, comprising at least one angularly displaceable support arm (660A,B) with first and second ends; a cam (680) connected by connecting means (692,783) to said first end of the support arm to effect spacing of the two surfaces, the said cam having a larger arcuate surface (680A) and a smaller arcuate surface (680B), the said arcuate surfaces defining a centre point about which the cam pivots as the said arm (660A,B) is angularly displaced; means (695) for securing the said arm (660A,B) and said cam (680) in fixed engagement; means (664) disposed at the second end of the arm for permitting its angular displacement as the spacing between the first said two surfaces (2,3) changes; and means (692) for connecting the arm (660A,B) and the cam to the one said surface (620), characterised in that said connecting means are adapted to permit angular movement of the cam relative to the support arm, and in that the securing means (695) comprise a latching means which is disengageable to permit the angular adjustment of the cam relative to the support arm and re-engageable to secure the support arm and cam together in different positions of angular adjustment.

2. The suspension system of Claim 1, wherein the said means for connecting the arm (660A,B) and the cam (680) to the said one surface (620) comprises a rod (692) connectable to a biasing device (690).

3. The suspension system of claim 1 or 2, wherein the said angular adjustment between the cam (680) and the arm (660A,B), when disengaged is effected by a compression spring (730).

4. The suspension system of Claim 3, further comprising an extension spring (690) in operative engagement with the cam (680) and the said compression spring (730) for providing a suspension force.

5. The suspension system of any one of Claim 1 to 4, wherein the said cam (680) engages a cam follower (722) coupled to the said one surface (620).

6. The suspension system of any one of Claims 1 to 5, comprising a pair of said cams (680) located therebetween.

7. The suspension system of any preceding claim, wherein the said securing means comprises pin means (695) secured to the support arm (660A,B) and cooperating with said latch means (750,752) formed on the cam or cams (680).

Patentansprüche

1. Aufhängungssystem zum Halten zweier Flächen (610, 620) in veränderlichem Abstand und im allgemeinen parallel zueinander, welches umfaßt: mindestens einen winkelverstellbaren Stützarm (660A, B) mit einem ersten und einem zweiten Ende; einen Nocken (680), der über Verbindungseinrichtungen (692, 783) mit dem ersten Ende des Stützarmes verbunden ist, um die beiden Flächen zu beabstanden, wobei der Nocken eine größere gekrümmte Oberfläche (680A) und eine kleinere gekrümmte Oberfläche (680B) aufweist und die gekrümmten Oberflächen einen Mittelpunkt definieren, um den der Nocken schwingt, wenn der Winkel des Arms (660A, B) verstellt wird; Einrichtungen (695) zum Feststellen des Arms (660A, B) und des Nockens (680); eine Einrichtung (664) am zweiten Endes des Arms, um dessen Winkelverschiebung zu ermöglichen, wenn sich der Abstand zwischen den beiden Flächen (2, 3) ändert; und eine Einrichtung (692) zum Verbinden des Arms (660A, B) und des Nokkens mit der einen Fläche (620),
dadurch gekennzeichnet, daß
die Verbindungseinrichtungen eine Winkelbewegung des Nockens zum Stützarm ermöglichen und dadurch, daß die Feststelleinrichtungen (695) eine Einschnappvorrichtung umfassen, die sich öffnen läßt, so daß die Winkeleinstellung des Nockens zum Stützarm möglich wird, und die sich erneut verriegeln läßt, um den Stützarm und den Nocken gemeinsam in verschiedenen Winkeleinstellpositionen festzustellen.

2. Aufhängungssystem nach Anspruch 1, wobei die Einrichtung zum Verbinden des Arms (660A, B) und des Nockens (680) mit der einen Fläche (620) einen Stab (692) umfaßt, der mit einer Vorspanneinrichtung (690) verbunden werden kann.

3. Aufhängungssystem nach Anspruch 1 oder 2, wobei die Winkeleinstellung zwischen dem Nocken (680) und dem Arm (660A, B) im entriegelten Zustand mittels einer Druckfeder (730) erfolgt.

4. Aufhängungssystem nach Anspruch 3, welches weiterhin eine Zugfeder (690) umfaßt, die während des Betriebs mit dem Nocken (680) und der Druckfeder (730) in Eingriff kommt, um eine Aufhängungskraft zu schaffen.

5. Aufhängungssystem nach einem der Ansprüche 1 bis 4, wobei der Nocken (680) mit einem Nockenstößel (722) in Eingriff kommt, der an die eine Fläche (620) gekoppelt ist.

6. Aufhängungssystem nach einem der Ansprüche 1 bis 5, welches ein dazwischenliegendes Paar Nokken (680) umfaßt.

7. Aufhängungssystem nach einem der vorangegangenen Ansprüche, wobei die Feststelleinrichtung Stifte (695) umfaßt, die am Stützarm (660A, B) befestigt sind und mit der Einschnappvorrichtung (750, 752) an dem oder an den Nocken (680) zusammenwirken.

Revendications

1. Système de suspension pour maintenir deux surfaces (610, 620) dans une relation généralement parallèle sous un espacement variable, comprenant au moins un bras de support angulairement déplaçable (660A, 660B) avec une première et une seconde extrémité ; une came (680) raccordée par des moyens de raccordement (692, 783) à ladite première extrémité du bras de support pour effectuer l'écartement des deux surfaces, ladite came présentant une surface arquée de grande taille (680A) et une surface arquée de petite taille (680B), lesdites surfaces arquées définissant un centre autour duquel pivote la came lorsque ledit bras (660A, 660B) est angulairement déplacé ; des moyens (695) pour attacher ledit bras (660A, 660B) et ladite came (680) en engagement fixe ; des moyens (664) disposés à la seconde extrémité du bras pour permettre son déplacement angulaire tandis que l'espacement entre lesdites premières deux surfaces (2, 3) change ; et des moyens (692) pour raccorder le bras (660A, 660B) et la came sur l'une desdites surfaces (620), caractérisé en ce que lesdits moyens de raccordement sont adaptés à permettre un mouvement angulaire de la came par rapport au bras de support, et en ce que les moyens d'attache (695) comprennent des moyens de verrouillage susceptibles d'être dégagés pour permettre le réglage angulaire de la came par rapport au bras de support, et d'être à nouveau engagés pour attacher le bras de support et la came ensemble dans des positions différentes de réglage angulaire.

2. Système de suspension selon la revendication 1, dans lequel lesdits moyens pour raccorder le bras (660A, 660B) et la came (680) sur ladite surface (620) comprennent une tige (692) susceptible d'être raccordée à un dispositif de sollicitation (690).

3. Système de suspension selon l'une ou l'autre des revendications 1 et 2, dans lequel ledit réglage angulaire entre la came (680) et le bras (660A, 660B), lorsqu'ils sont dégagés, est effectuée par un ressort de compression (730).

4. Système de suspension selon la revendication 3, comprenant en outre un ressort d'extension (690) en engagement fonctionnel avec la came (680) et ledit ressort de compression (730) pour produire une force de suspension.

5. Système de suspension selon l'une quelconque des revendications 1 à 4, dans lequel ladite came (680) engage un suiveur de came (722) accouplé à ladite surface (620).

6. Système de suspension selon l'une quelconque des revendications 1 à 5, comprenant une paire de cames (682) interposées.

7. Système de suspension selon l'une quelconque des revendications précédentes, dans lequel lesdits moyens d'attache comprennent des organes en tige (695) attachés au bras de support (660A, 660B) et coopérant avec lesdits organes de verrouillage (750, 752) formés sur ladite came ou lesdites cames (680).

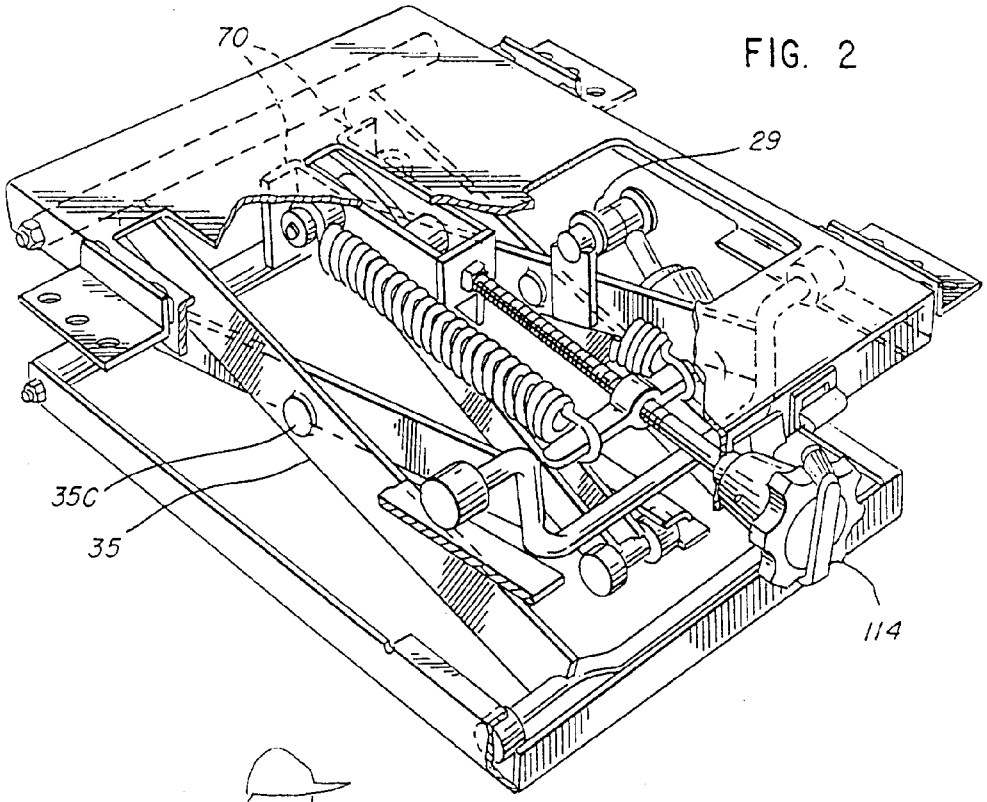


FIG. 2

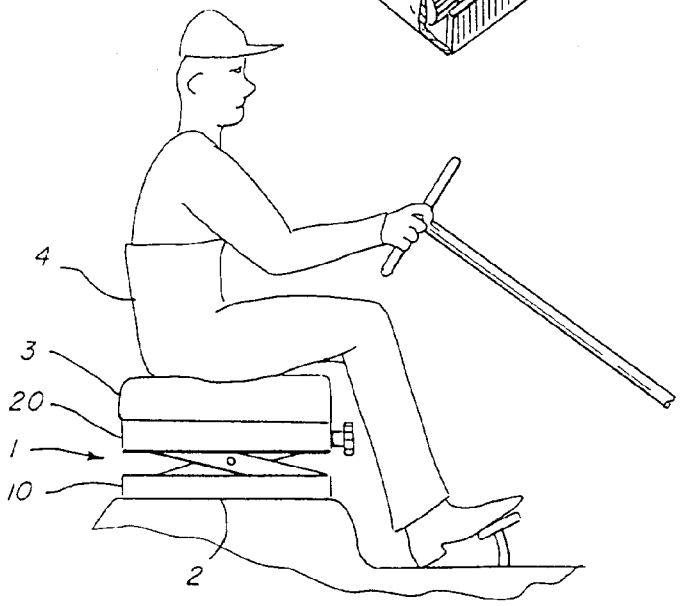


FIG. 1

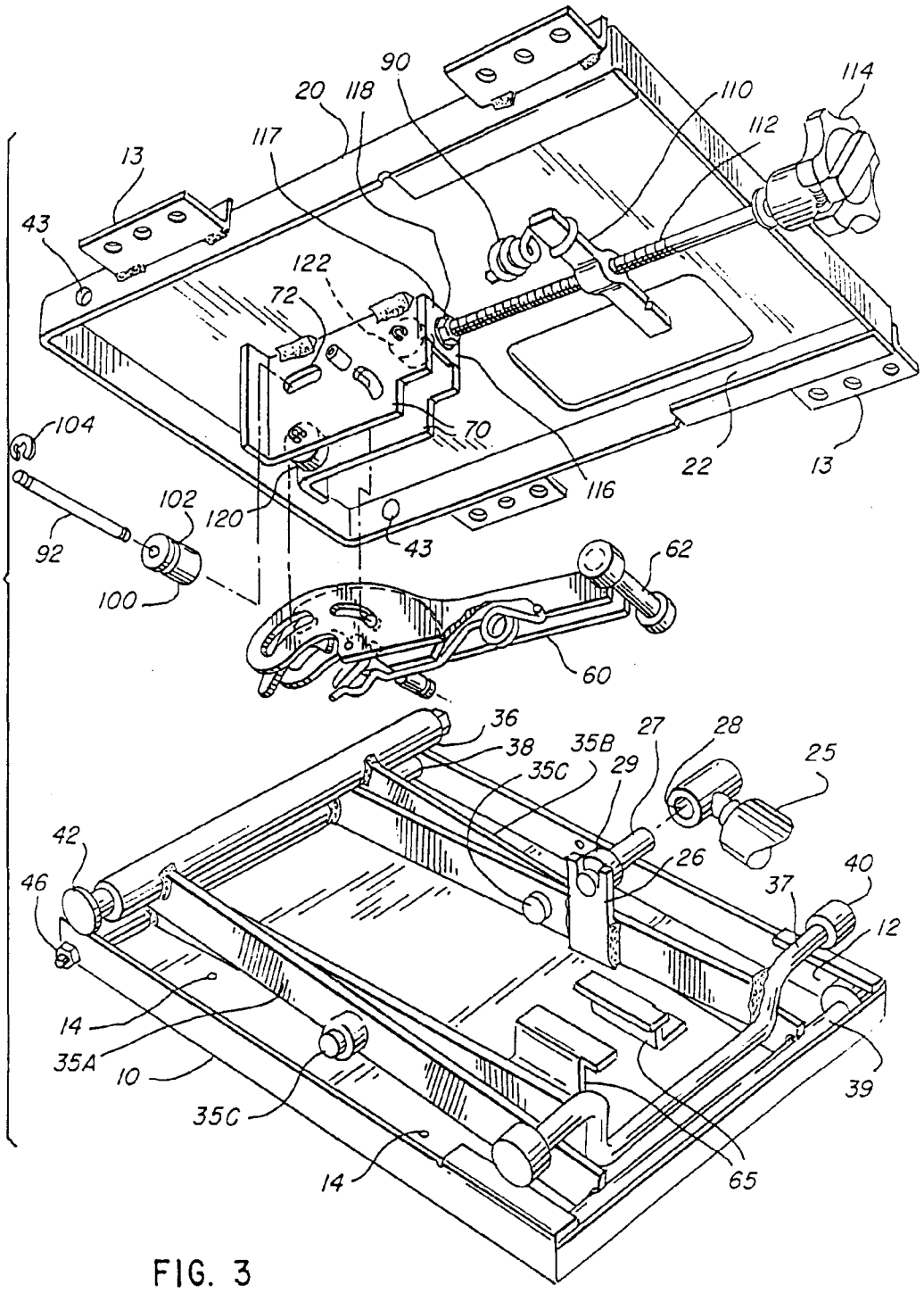

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122
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104
70
116
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13
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92
43
62
100
60
36
38
35B
27
28
25
35C
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42
26
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46
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12
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35A
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14

FIG. 3

FIG. 4

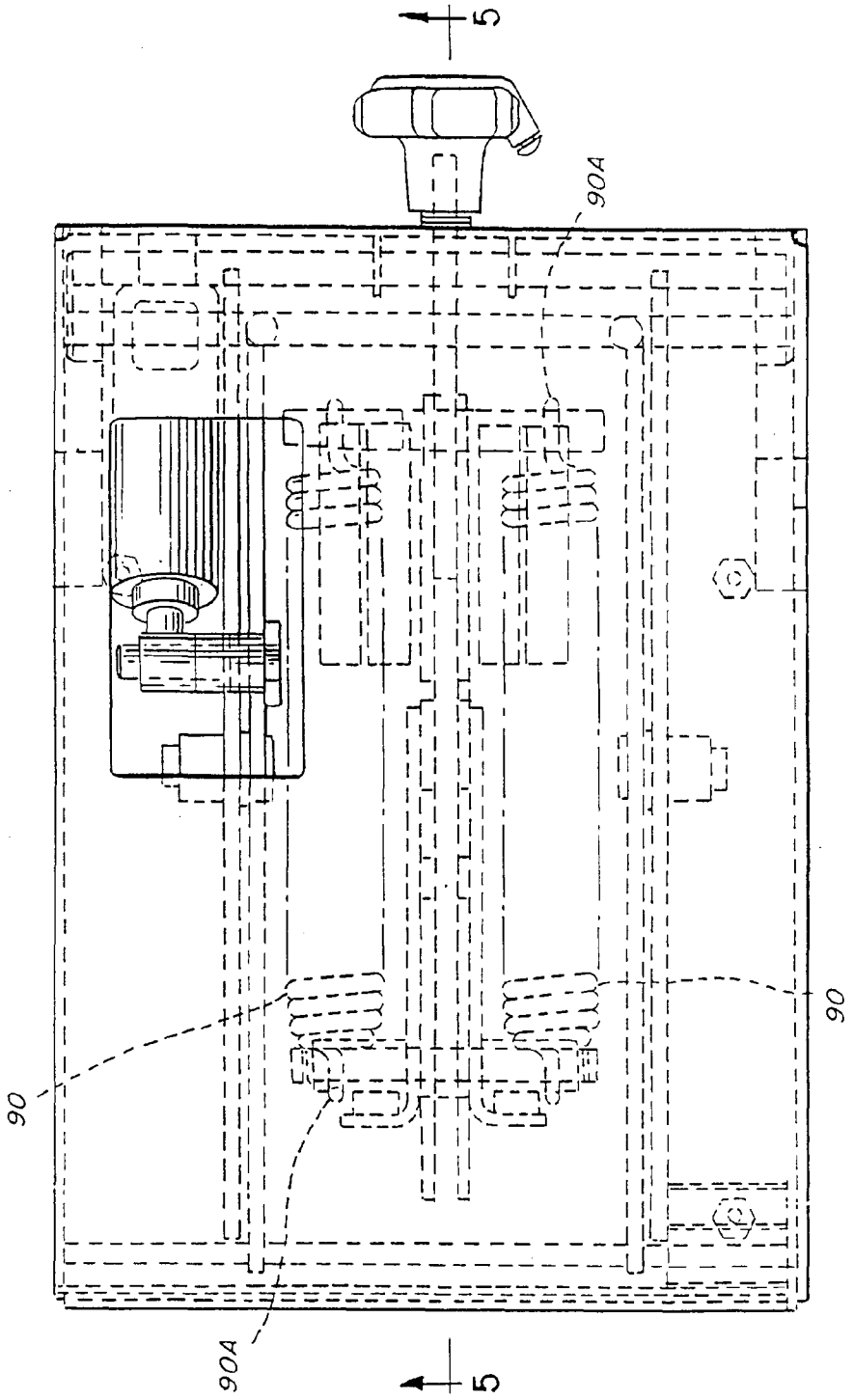


FIG. 5

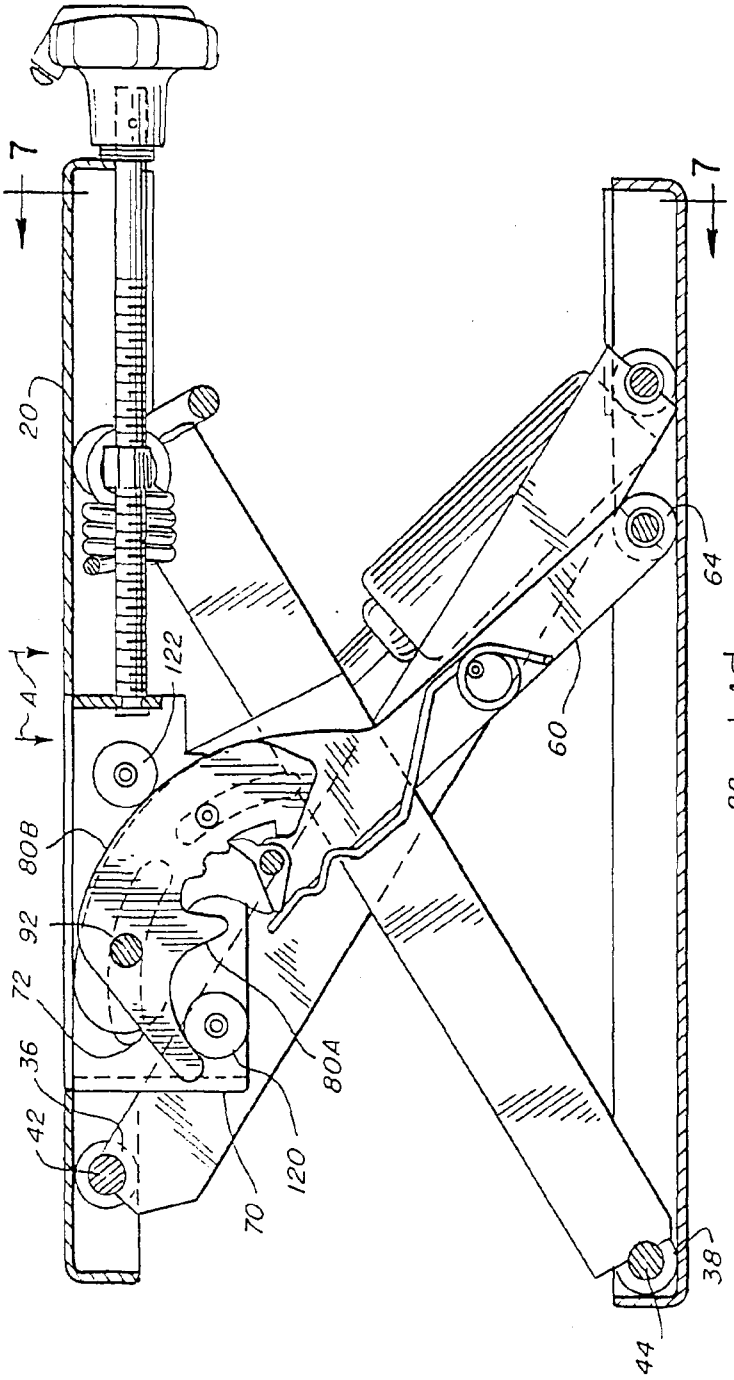
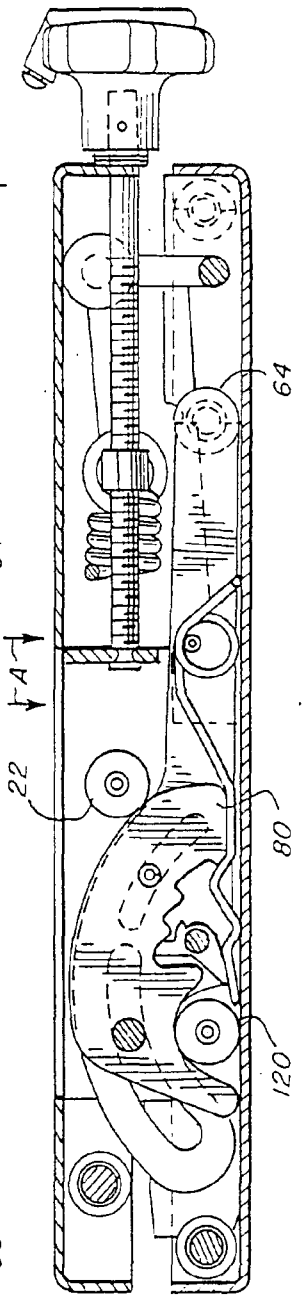


FIG. 6



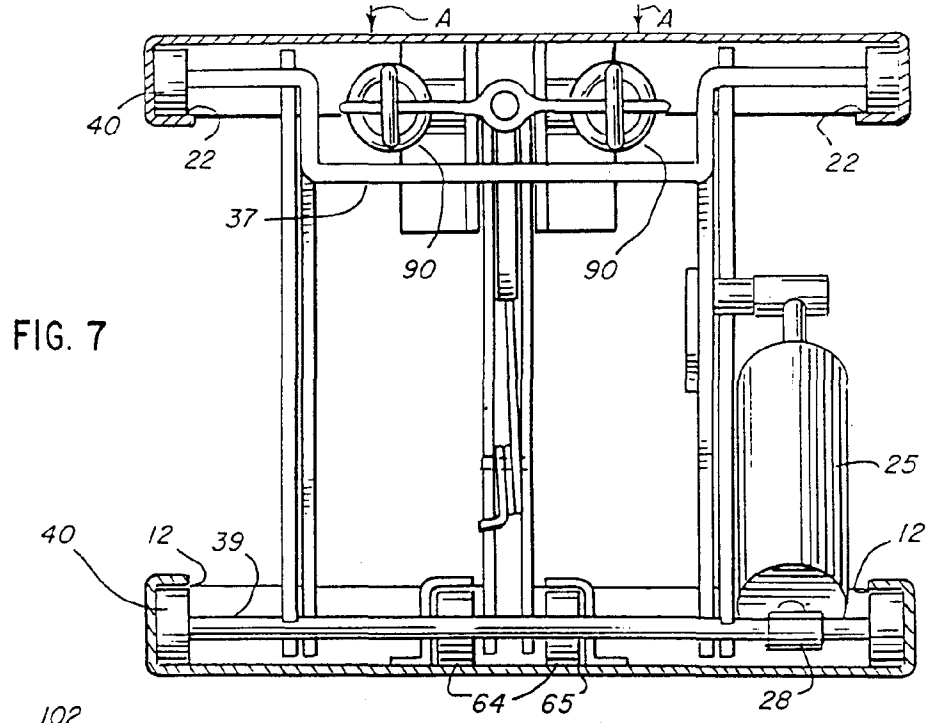

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FIG. 7

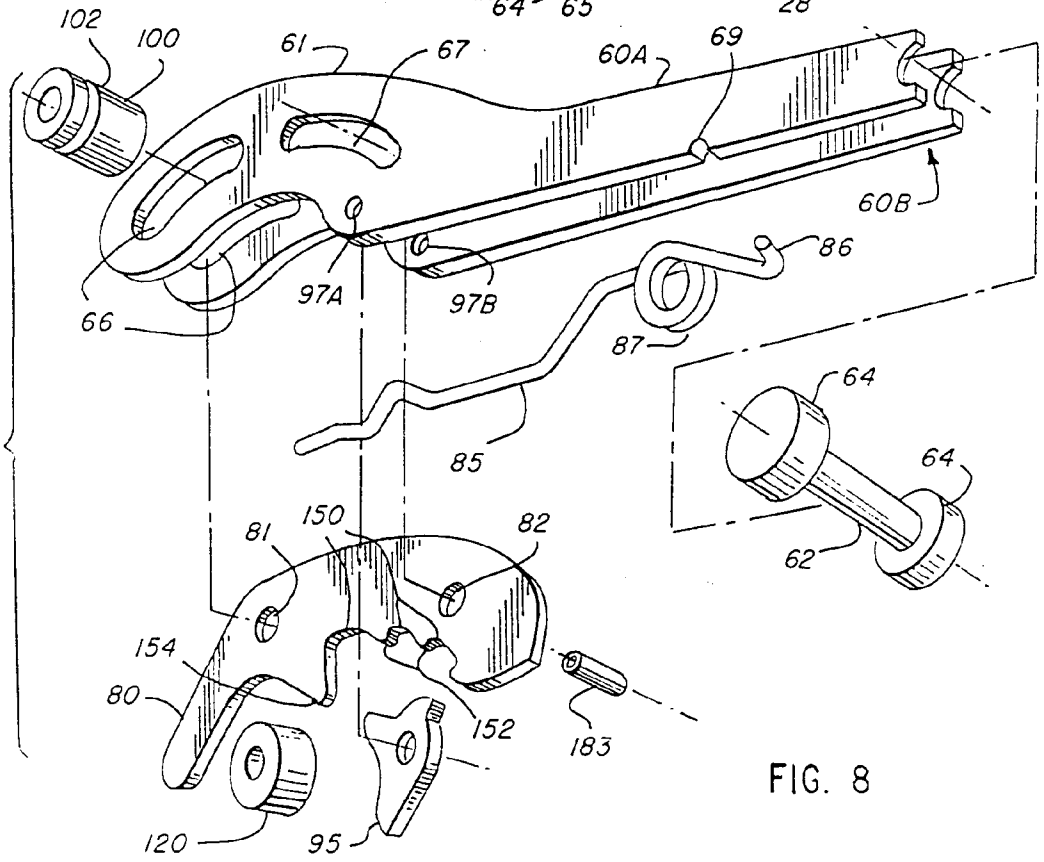

102
100
61
67
60A
69
60B
86
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97A
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FIG. 8

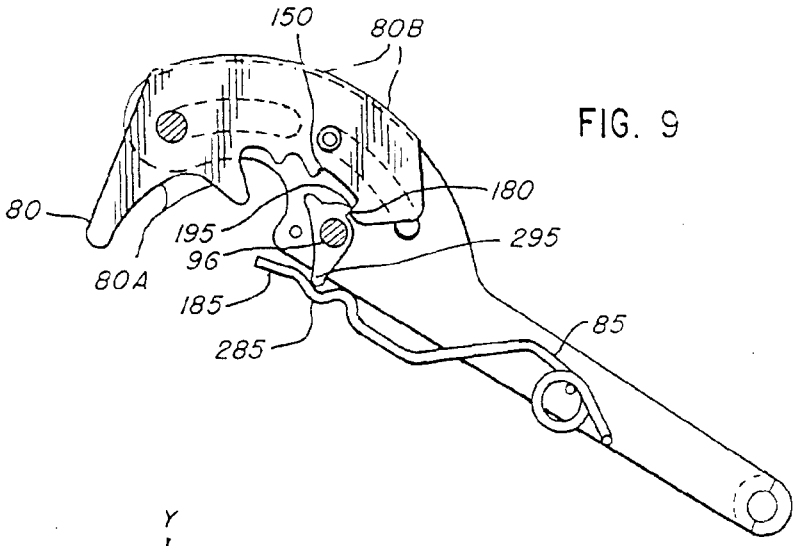


FIG. 9

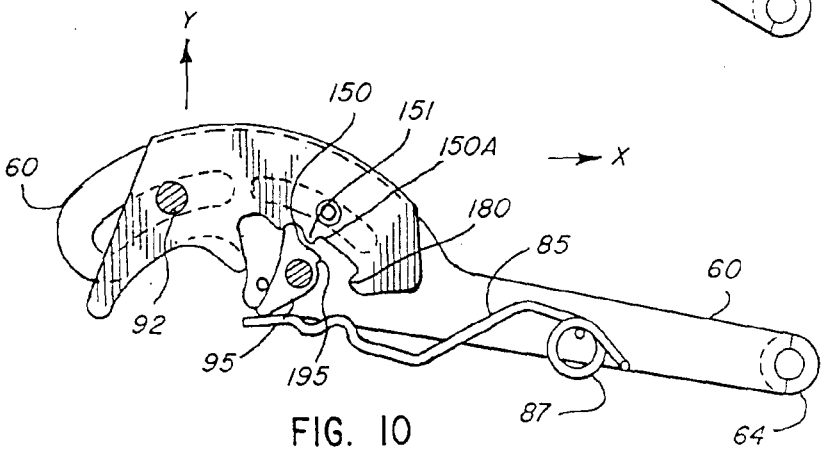


FIG. 10

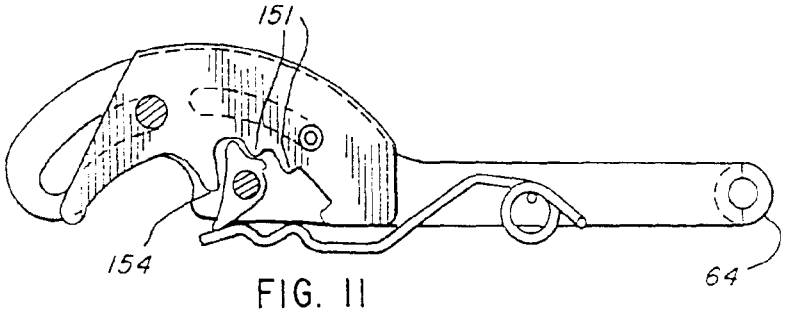


FIG. 11

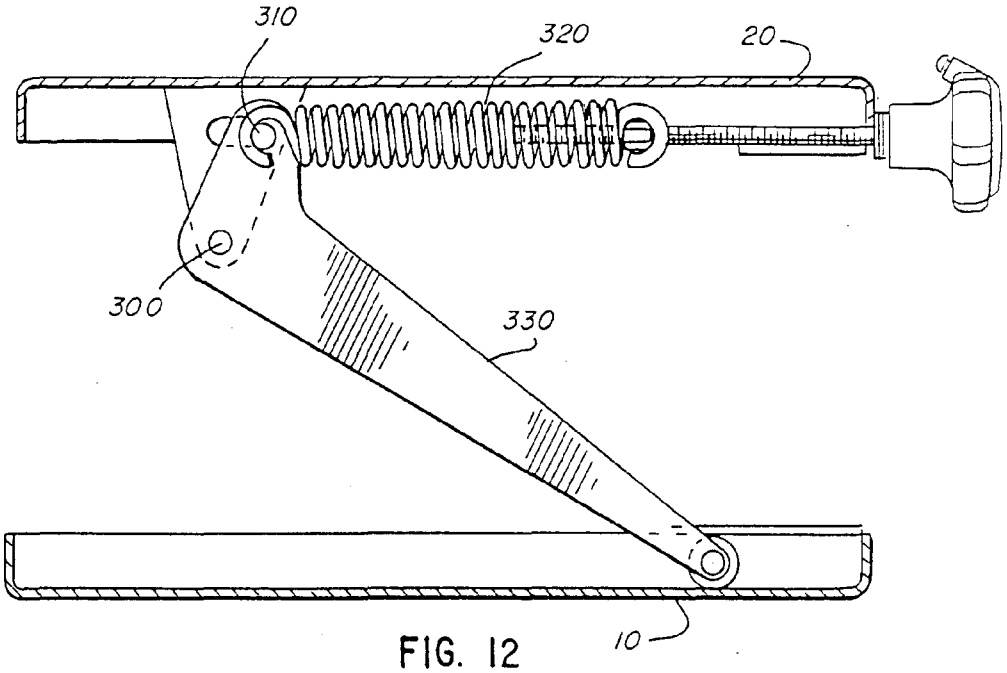


FIG. 12
Prior Art

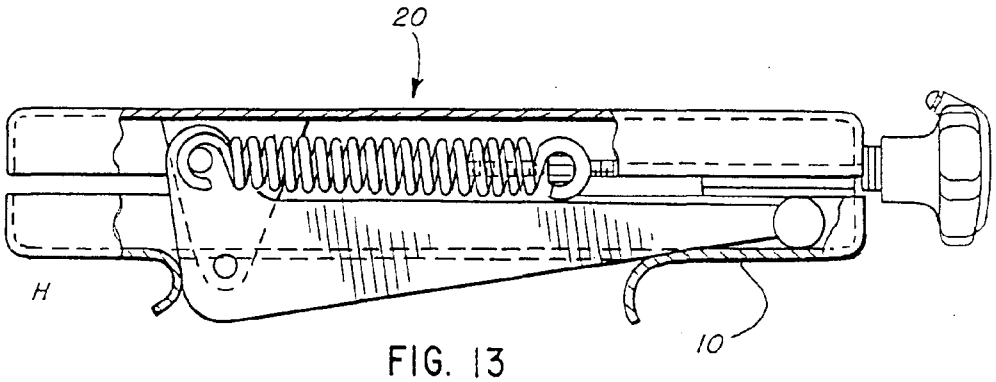


FIG. 13
Prior Art

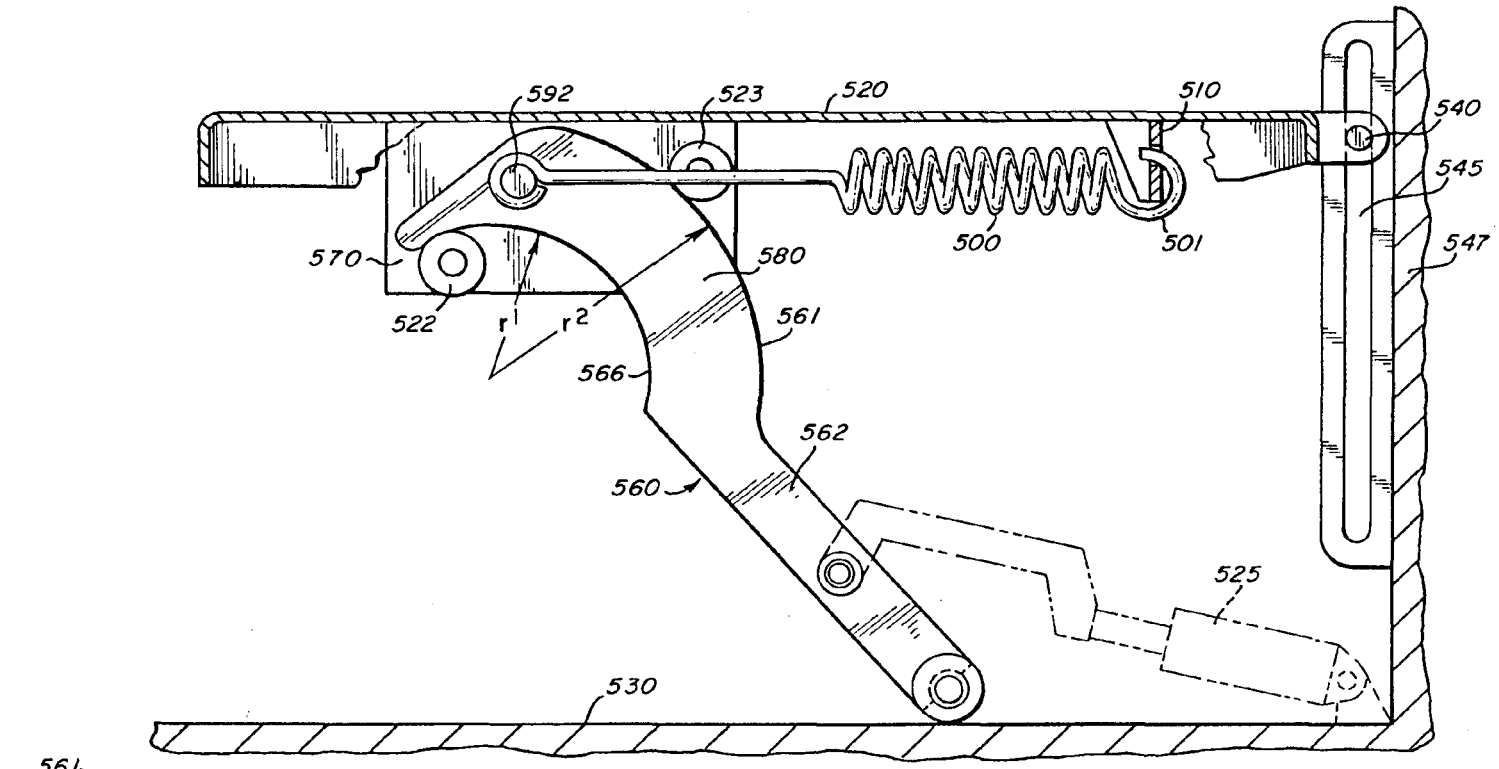

592
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FIG. 15

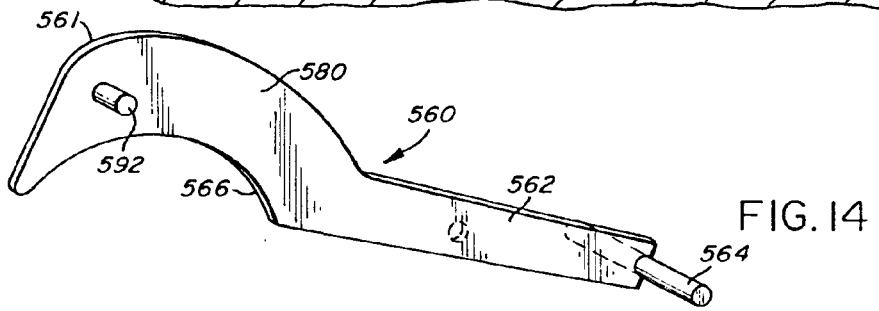

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FIG. 14

FIG. 16

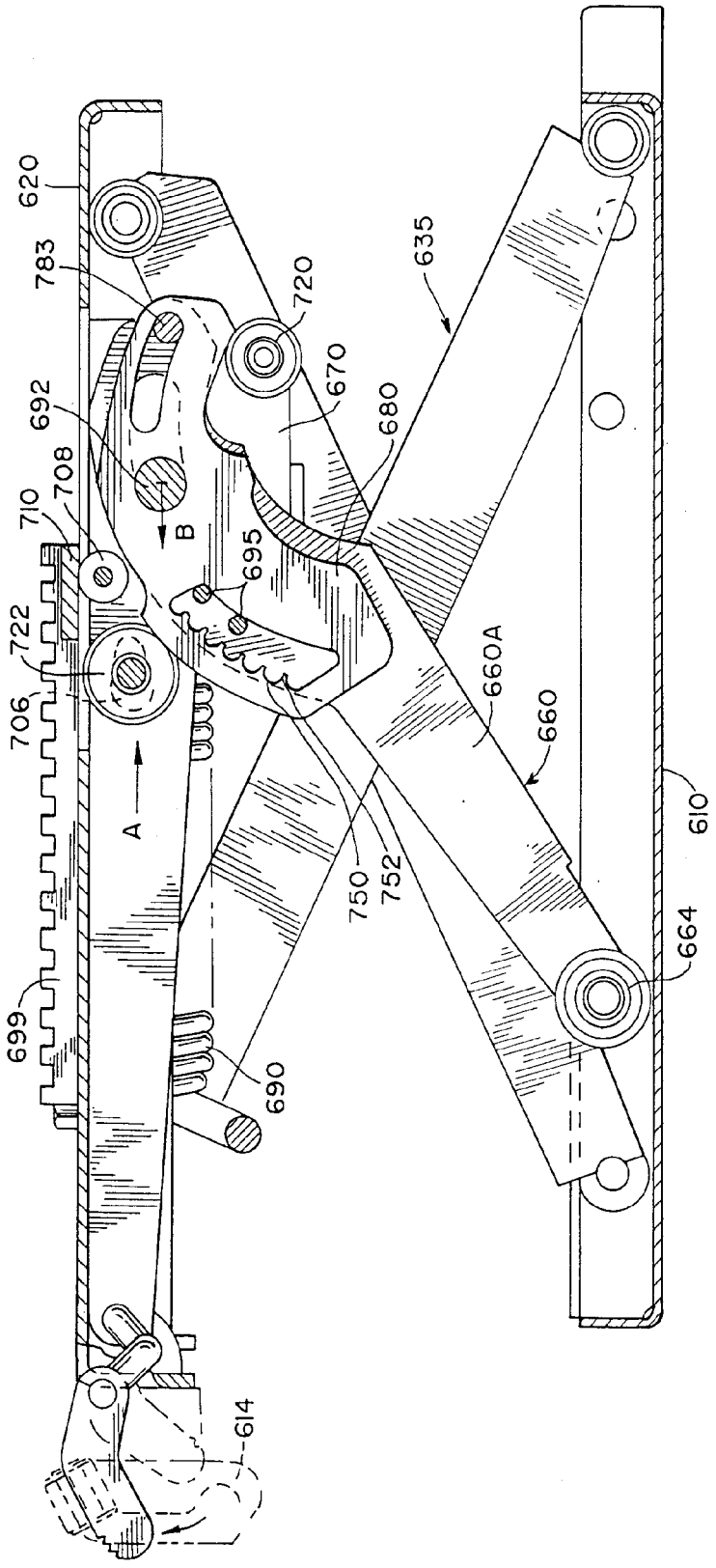

620
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750
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699
690
614

FIG. 17

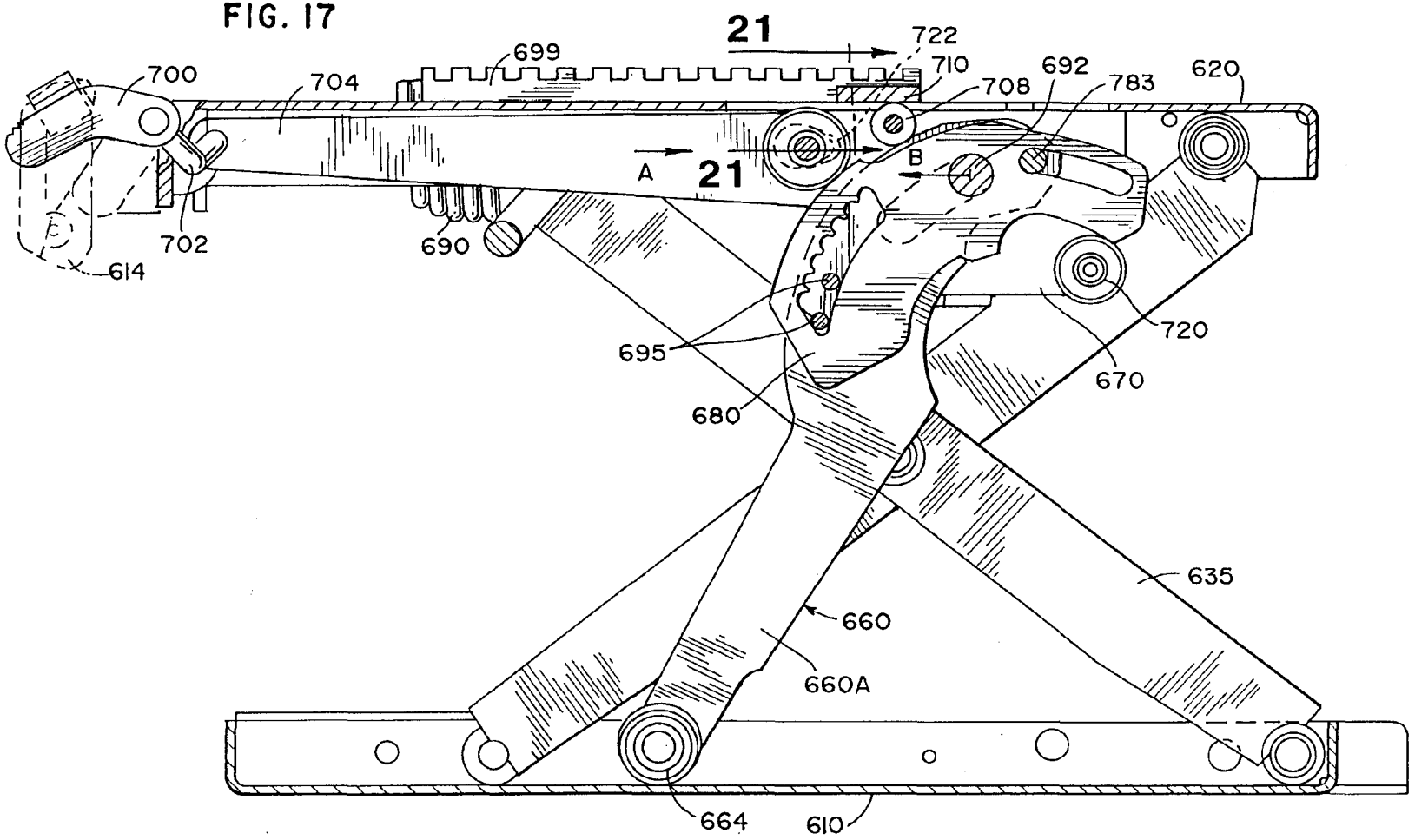

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660A
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FIG. 18

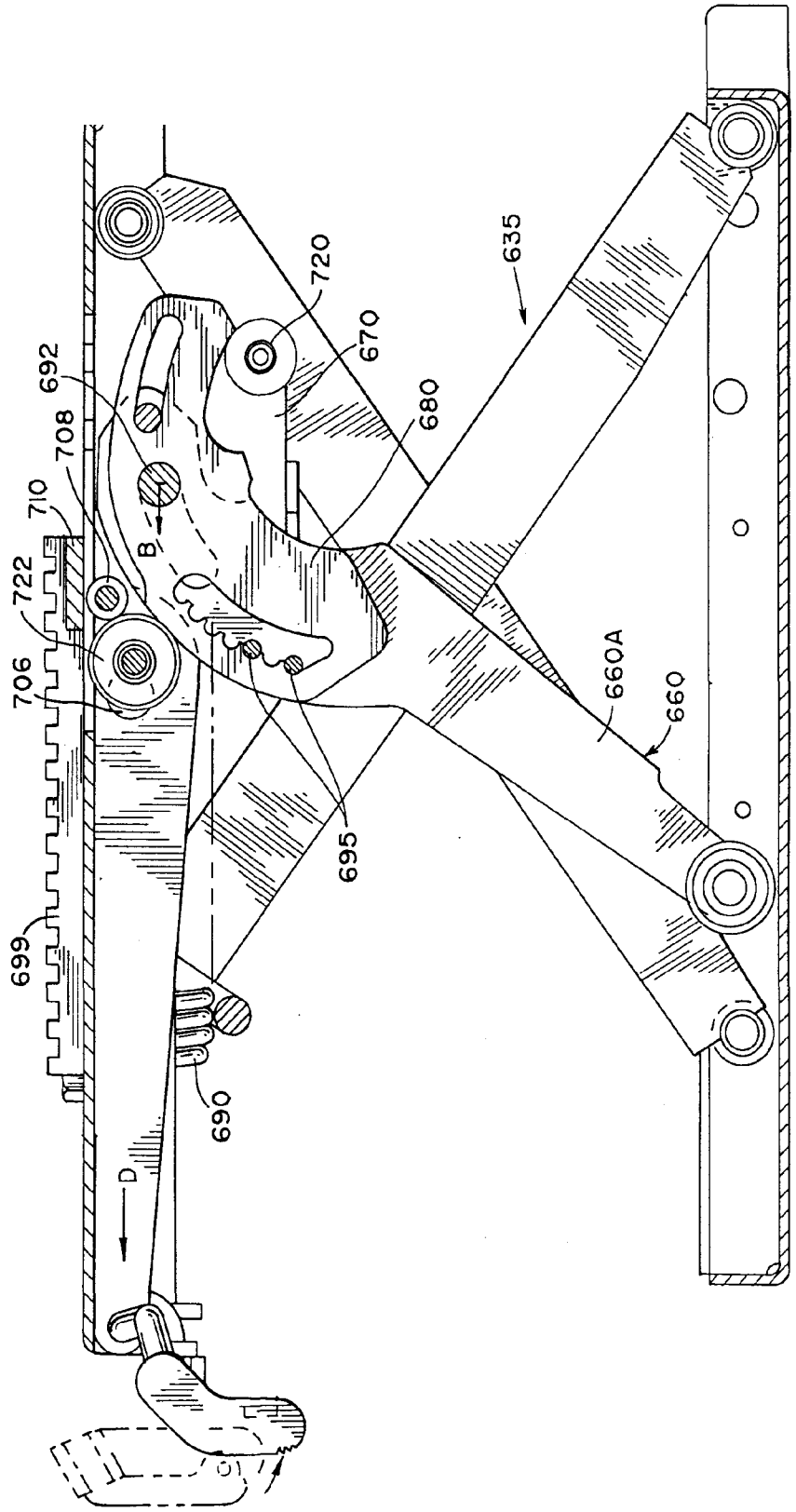


FIG. 21

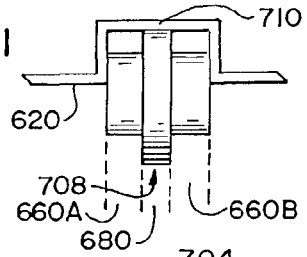


FIG. 19

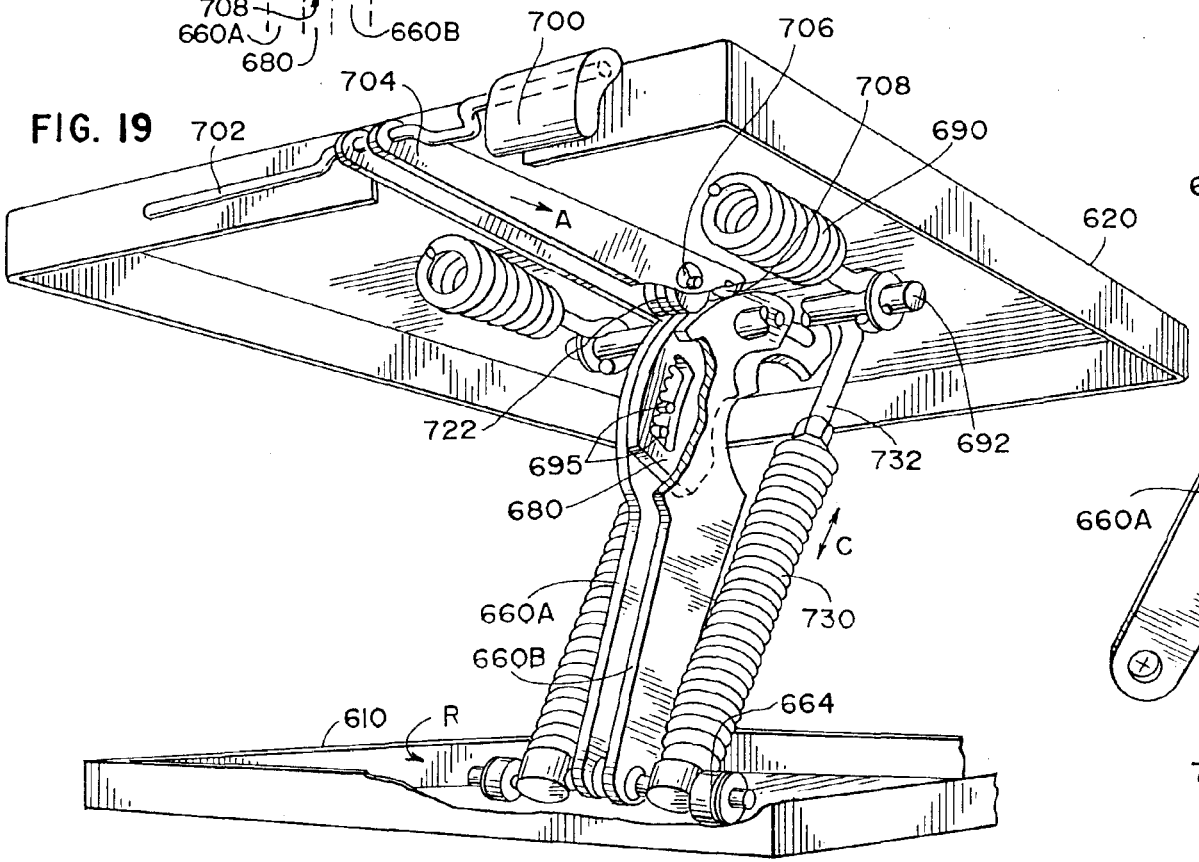
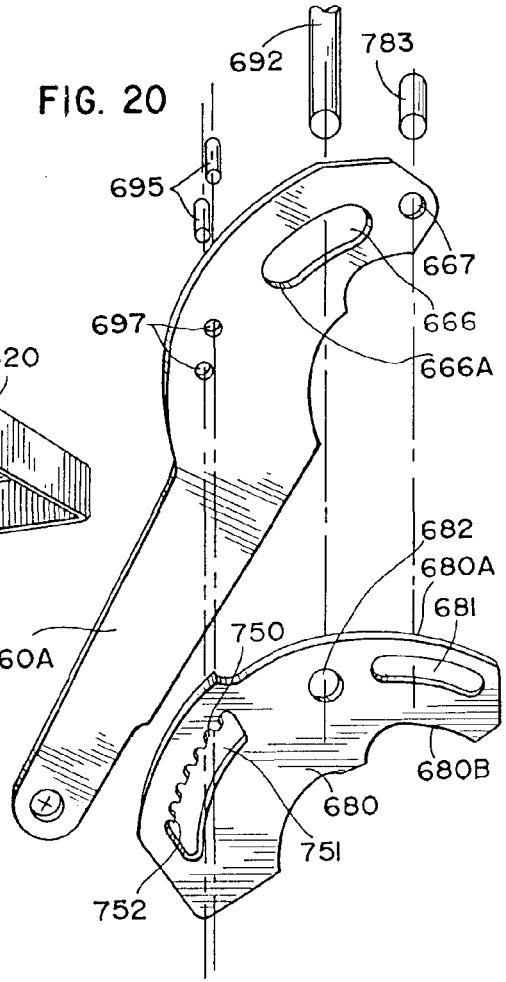


FIG. 20



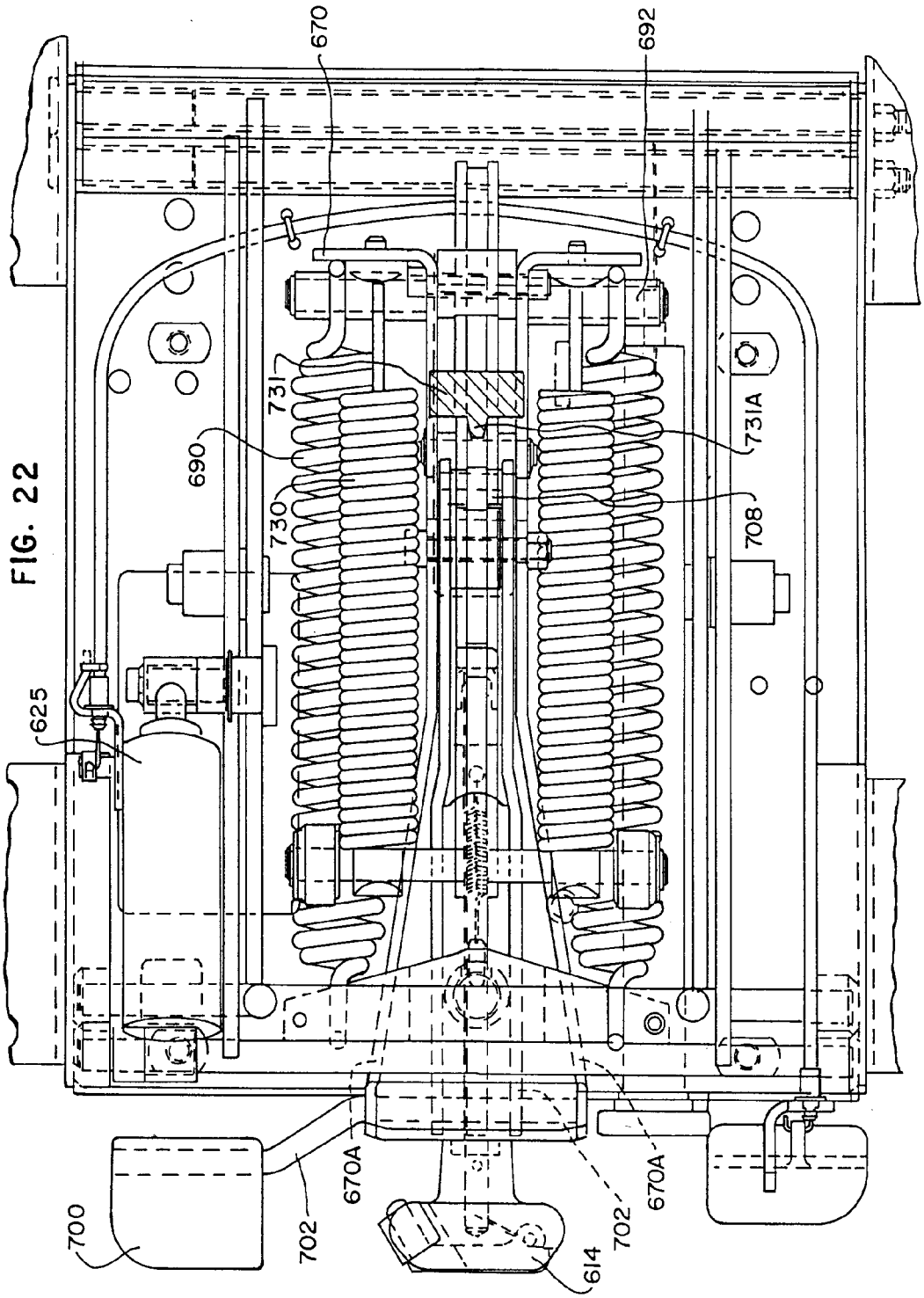


FIG. 22

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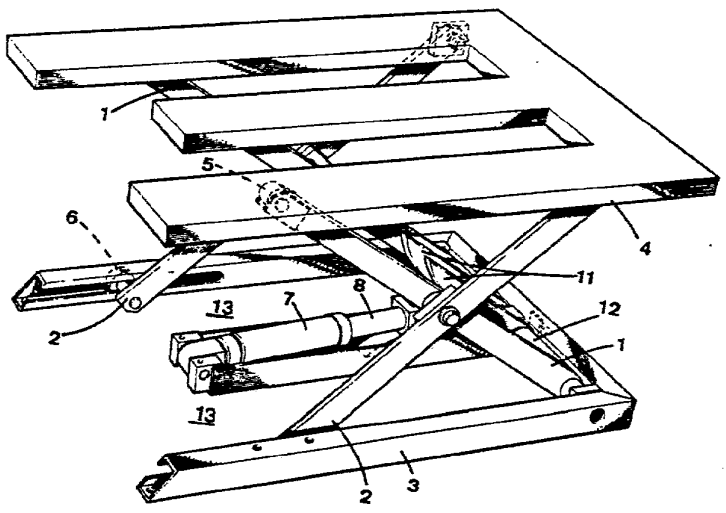
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(54) Title: DEVICE AT A HYDRAULIC LIFTING TABLE

(57) Abstract

Arrangement for a hydraulic lifting table of the scissor type with at least two pairs of scissor arms (1, 2) pivotally attached to one another. These are attached at their ends to a lower frame section (3) and an upper table section (4) in such a way as to be capable of pivoting and rolling. The arrangement also comprises a centrally positioned power transmission arrangement pivotally attached to the frame section, being preferably a hydraulic cylinder, the piston rod (8) of which is so arranged as to engage via rollers (9) with guide curves (10, 11). One (10) of these is attached to the frame section (3), and the other (11) is operatively connected to a pair of scissor arms (1). The guide curves (10, 11) are moved towards and away from one another by means of the rollers (9) for the purpose of raising the lifting table and vice versa. A characteristic feature of the invention is the fact that the table section (4) has the form of a plain symmetrical 'E', in which cross-pieces of the 'E'-shape cover the pairs of scissor arms (1, 2) and the power transmission arrangement (7, 8), and that the guide curves (10, 11) are centrally positioned, e.i. in the vicinity of the hydraulic cylinder (7), and that the operative connection constists of a shaft (12) pivotally mounted in the frame section (3), which shaft constitutes the operative connection between the guide curve (11) and the pair of scissor arms (1).



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Device at a hydraulic lifting table

The present invention relates to an arrangement for a hydraulic lifting table of the scissor type with at least two pairs of scissor arms pivotally attached to one another, which scissor arms are attached at their ends to a lower frame section and to an upper table section in such a way as to be capable of pivoting and rolling, and a centrally positioned power transmission arrangement pivotally attached to the frame section, being preferably a hydraulic cylinder, the piston rod of which is so arranged as to engage via rollers with guide curves, one of which is attached to the frame section, and the other is operatively connected to a pair of scissor arms, and which are moved towards and away from one another by means of the rollers for the purpose of raising the lifting table and vice versa.

In the case of such lifting tables of a previously disclosed kind, it is difficult to manoeuvre a load up onto the lifting table by hand using a so-called hand pallet truck; this is because the smallest difference in height between the upper surface of the lifting table and a level floor on which the lifting table is resting is so great that an inclined plane is necessary in order to equalize the difference in height. In the absence of special lifting equipment, it will be necessary, if the load weighs more than one is able to lift manually, to use the lifting table to lift both the hand pallet truck and the load.

The object of the present invention is to make available a hydraulic lifting table which permits the load, with the help of the hand pallet truck, to be placed on the lifting table, which is made possible by the table section having the form of a plain symmetrical 'E', in which the cross-pieces of the 'E'-shape cover the pairs of scissor arms and the power transmission arrangement, by the guide curves being centrally positioned, i.e. in the vicinity of the hydraulic cylinder, and by the operative connection consisting of a shaft pivotally mounted in the frame

section, which shaft constitutes the operative connection between the guide curve and the pair of scissor arms.

Accessibility is further increased through the table section having the form of a plain symmetrical 'E', in which the cross-pieces of the 'E'-shape cover the pairs of scissor arms and the power transmission arrangement.

The fact that all the guide curves in accordance with a particular characteristic feature are of identical profile means that the above-mentioned smallest difference in height is as small as possible.

The invention is described below in further detail with reference to the accompanying drawing, in which Fig. 1 illustrates in perspective view one embodiment of a lifting table in accordance with the invention, with the table in a raised position. Fig. 2 is a perspective view which illustrates the lifting table in accordance with Fig. 1 in the collapsed state. Figs. 3 and 4 shows a cross-section through the lifting table in Figs. 1 and 2.

A hydraulic lifting table in accordance with the invention comprises two articulated pairs of scissor arms 1, 2, a lower frame section 3 and an upper table section 4. The pair of scissor arms 1 is connected at its lower end in such a way as to articulate with the frame section 3, and is equipped at its upper end with rollers 5 by means of which the pair of scissor arms 1 rolls against the table section 4. The pair of scissor arms 2 is similarly connected at its upper end in such a way as to articulate with the table section 4, and is equipped at its lower end with rollers 6 enabling it to roll against the frame section 3.

For the purpose of raising and lowering the lifting table there is provided a centrally positioned power tramnsission arrangement 7 which is pivotally attached to the frame section 3, being

preferably a hydraulic cylinder, the piston rod 8 of which is equipped at its outer end with rollers 9. These are so arranged as to engage with guide curves 10, 11, one 10 of which is attached to the frame section 3, and the other 11 is operatively connected to the pair of scissor arms 1. A construction of this kind is previously disclosed and functions as follows: as the cylinder piston is forced out, the curves 10, 11 are forced apart by the rollers 9, causing the table section 4 to be raised. A similar procedure, but in reverse, takes place for lowering the table section 4.

According to the invention the guide curves 10, 11 are also centrally positioned, i.e. in the immediate vicinity of the cylinder 7. The operative connection between the guide curves 11 and the pair of scissor arms 1 consists of a shaft 12 pivotally mounted in the frame section 3.

The advantage mentioned by way of introduction to the effect that the forks of a truck can be introduced into the spaces indicated by 13 in Figs. 1 and 2 is achieved through the construction in accordance with the invention. The load which is supported by the forks can thus be positioned simply on top of the table section 4 and can then be raised by the lifting table to the desired height. The truck need not be raised in conjunction with this, but can remain on the floor. The lifting table can, of course, also be used for moving a load conveniently from the table section 4 to the forks of a fork truck.

Patent Claims

1. Arrangement for a hydraulic lifting table of the scissor type with at least two pairs of scissor arms (1, 2) pivotally attached to one another, which scissor arms are attached at their ends to a lower frame section (3) and an upper table section (4) in such a way as to be capable of pivoting and rolling, and a centrally positioned power transmission arrangement pivotally attached to the frame section, being preferably a hydraulic cylinder (7), the piston rod (8) of which is so arranged as to engage via rollers (9) with guide curves (10, 11), one (10) of which is attached to the frame section (3), and the other (11) is operatively connected to a pair of scissor arms (1), and which are moved towards and away from one another by means of the rollers (9) for the purpose of raising the lifting table and vice versa, c h a r a c t e r i z e d in that the table section (4) has the form of a plain symmetrical 'E', in which cross-pieces of the 'E'-shape cover the pairs of scissor arms (1, 2) and the power transmission arrangement (7, 8), in that the guide curves (10, 11) are centrally positioned, i.e. in the vicinity of the the hydraulic cylinder (7), and in that the operative connection consists of a shaft (12) pivotally mounted in the frame section (3), which shaft constitutes the operative connection between the guide curve (11) and the pair of scissor arms (1).

2. Arrangement according to Patent Claim 1, c h a r a c t e r i z e d in that all the guide curves (10, 11) are of identical profile.

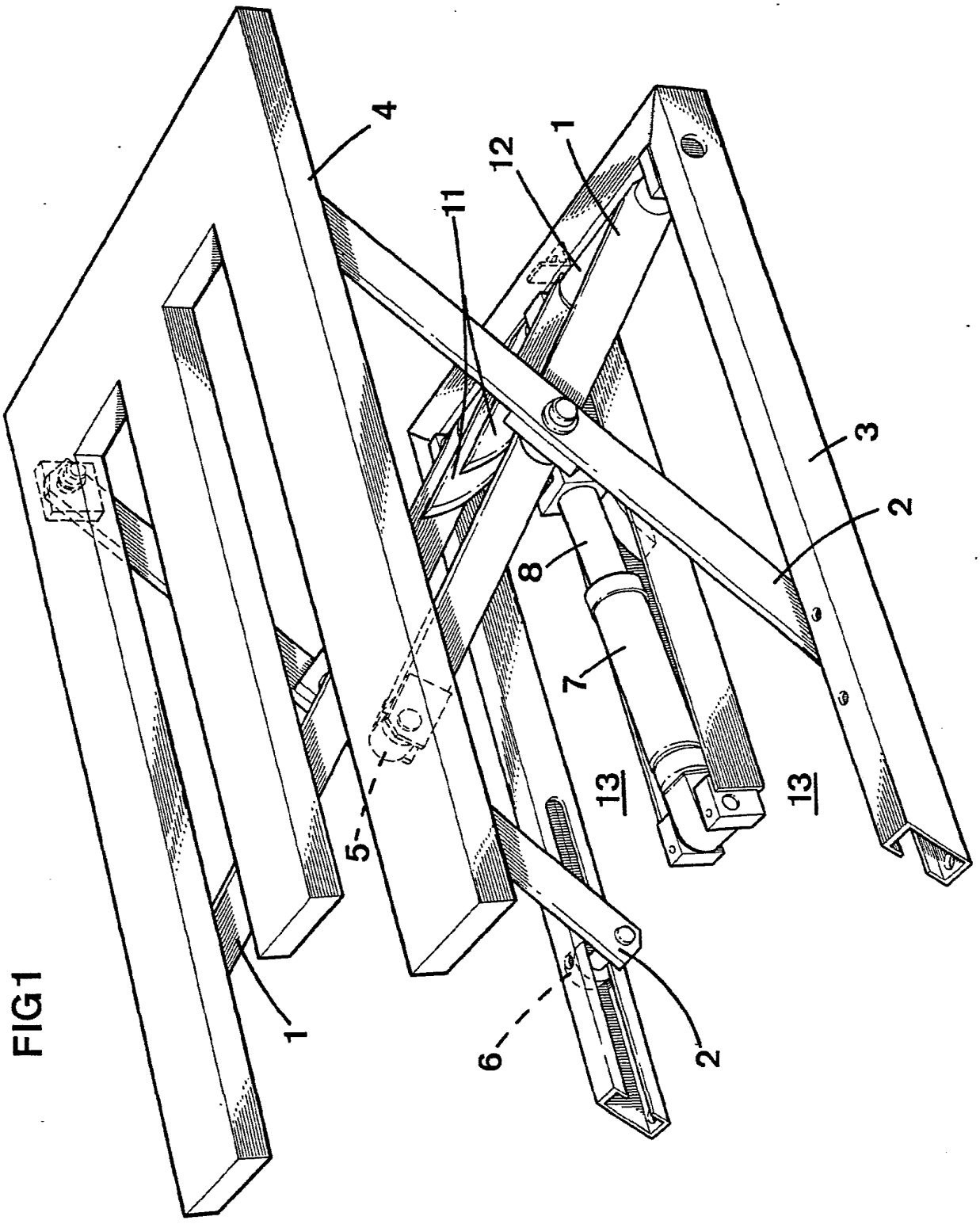


FIG1

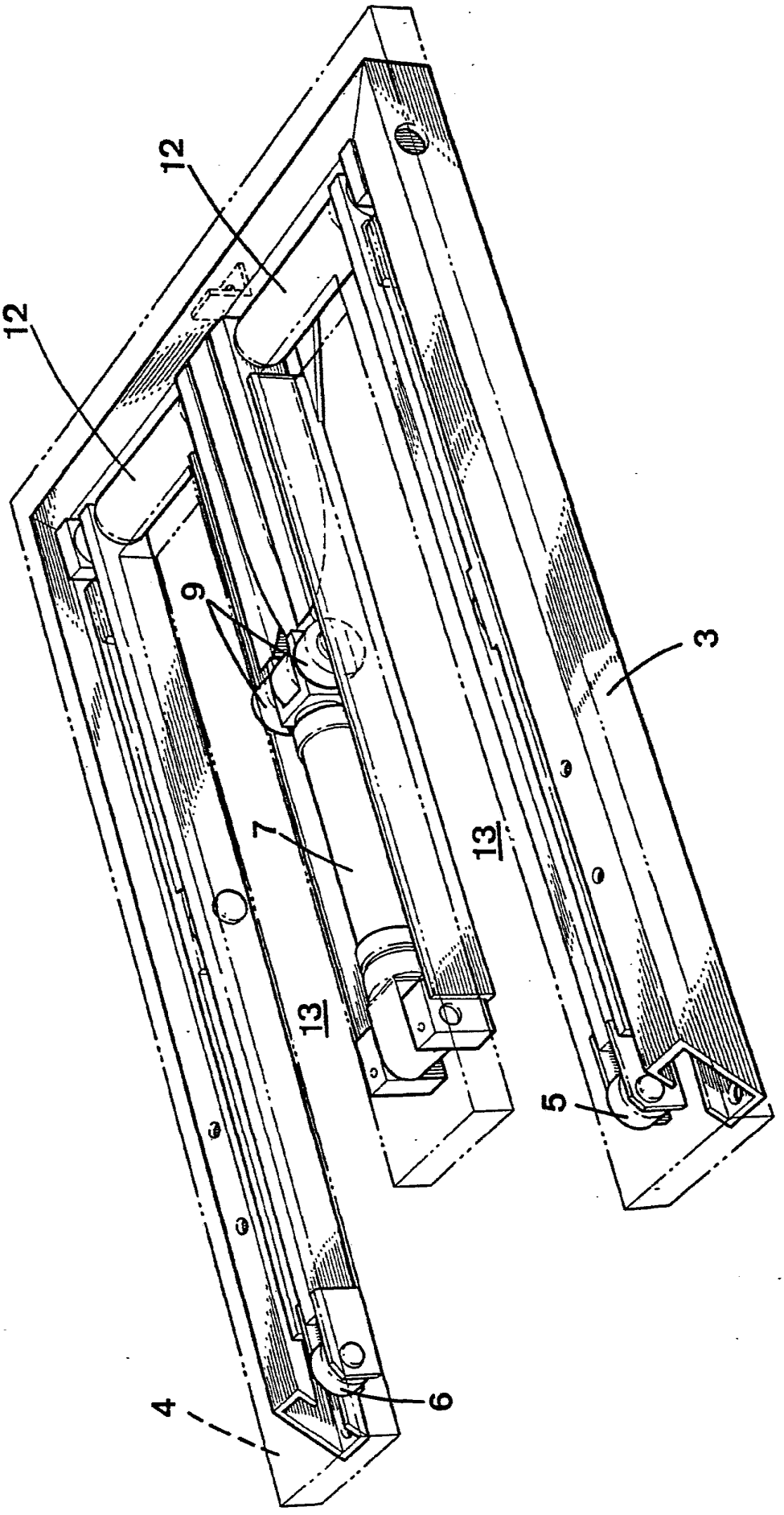


FIG 2

FIG 4

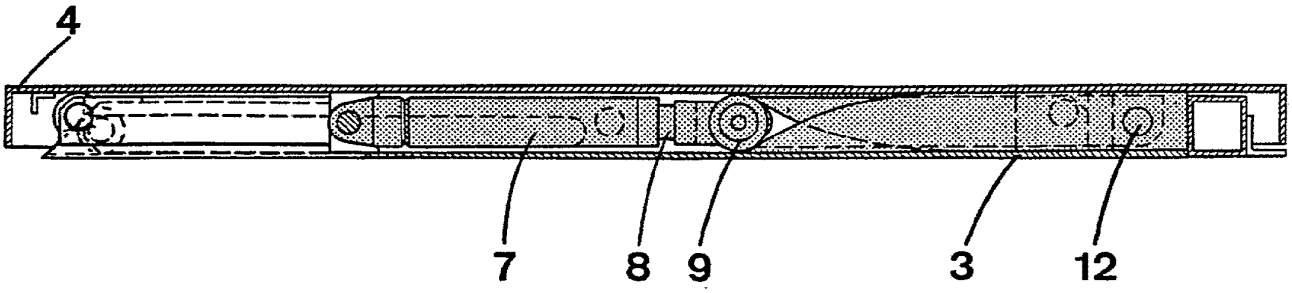
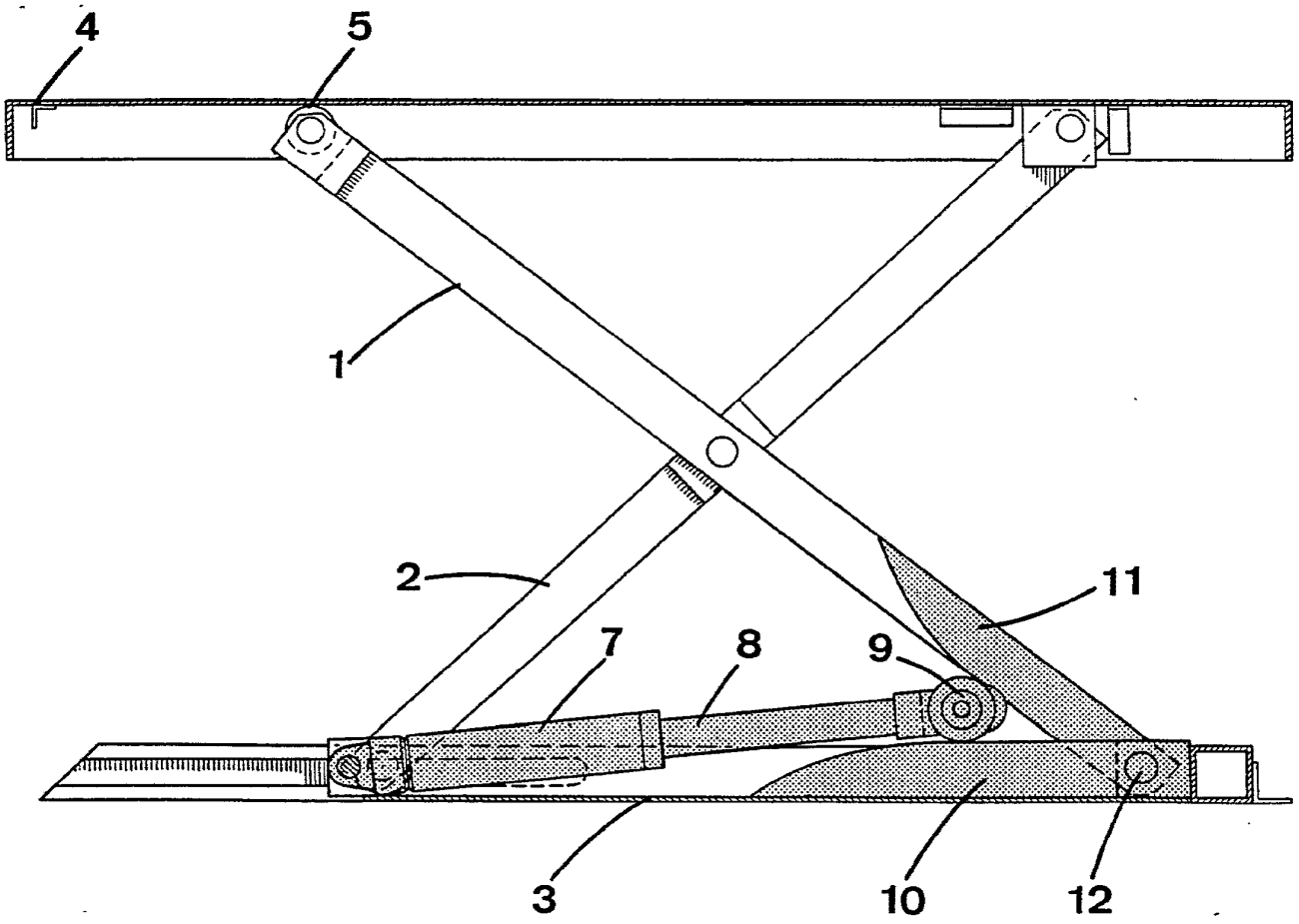


FIG 3



INTERNATIONAL SEARCH REPORT

International Application No PCT/SE86/00165

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [6]

According to International Patent Classification (IPC) or to both National Classification and IPC

B 66 F 7/08, B 66 F 3/22 4

II. FIELDS SEARCHED

Minimum Documentation Searched [7]

Classification System	Classification Symbols
IPC 4	B 66 F 3/22, 7/00, /06-/08; B 65 D 19/36-/40; B 65 G 69/22-/26; E 04 G 1/22

.../...

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched [8]

SE, NO, DK, FI classes as above

III. DOCUMENTS CONSIDERED TO BE RELEVANT [9]

Category [10]	Citation of Document, [11] with indication, where appropriate, of the relevant passages [12]	Relevant to Claim No. [13]
A	DE, A1, 2 253 765 (CONSTRUCTIONS EDMOND COIGNET) 16 August 1973	1
A	GB, A, 846 161 (TIPTON WELDED FABRICATIONS LIMITED) 24 August 1960	1, 2
A	DE, B1, 1 207 061 (VEREINIGT FLUGTECHNISCHE WERKE GESELLSCHAFT) 16 December 1965	1, 2
A	FI, B, 60 841 (KONSULTTITOIMISTO LOGMA REINO LEISSO KY) 14 December 1980	1
A	SE, B, 418 727 (K G PETTERSSON) 22 June 1981	1
A	DE, A1, 3 248 414 (OTTO NUSSBAUM GMBH & CO KG) 28 June 1984	1

* Special categories of cited documents: [10]

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
1986-06-30	1986 -07- 09
International Searching Authority	**Signature of Authorized Officer**
Swedish Patent Office	Tommy Blomberg

Form PCT/ISA/210 (second sheet) (January 1985)

FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

II Fields searched (cont)

US Cl 254: 8-9, 122;
187: 8.71-8.72, 18;
182: 63, 69, 141, 148, 157-158;
108: 56.1-/.3, 57.1

V. ☐ OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE [1]

This international search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1. ☐ Claim numbers....., because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claim numbers....., because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claim numbers....., because they are dependent claims and are not drafted in accordance with the second and third sentences of PCT Rule 6.4(a).

VI. ☐ OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING [2]

This International Searching Authority found multiple inventions in this international application as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.

2. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:

3. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:

4. ☐ As all searchable claims could be searched without effort justifying an additional fee, the International Searching Authority did not invite payment of any additional fee.

Remark on Protest

☐ The additional search fees were accompanied by applicant's protest.

☐ No protest accompanied the payment of additional search fees.

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FR-A- 2 302 208
US-A- 3 826 457
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(3.10/3.6/3.3.1)

EP 0 342 779 B1

Description

The present invention relates to various suspension mechanisms including seat suspensions such as those typically used in trucks and construction and farming equipment.

There is a continuing need for suspension mechanisms that are simply constructed and inexpensive while still meeting manufacturers' ever increasing demands for compactness and comfort. An additional need exists for such a device whose suspension and ride characteristics can be easily modified.

Some seat suspensions have damping means such as shock absorbers. These have created several problems. Most notably, the stroke of shock absorbers does not have a linear relationship to the vertical movement of the seat. The nonlinear relationship between the stroke of the shock absorber and the vertical movement of the seat diminishes the performance and ride characteristics of such a suspension device.

In addition, shock absorbers or other such fluid devices often have difficulty dissipating heat, especially when enclosed within a device where air circulation is not adequate. This causes both poor performance and a shorter life of the shock absorber.

Other difficulties have been encountered in the height adjustment mechanisms of seat suspensions. Frequently such mechanisms are difficult to reach, require levers or triggers that can pinch an operator, and generally are complicated and expensive. Furthermore, such mechanisms can be dangerous to operate when a vehicle is moving and the operator must grope or search for the adjustment mechanism.

Finally, most seat suspensions devices transmit the load from the seat to the suspension springs through steel bars comprising scissor arms or parallelogram linkages that carry virtually the entire load of the seat. These bars interact directly with the suspension springs. Thus, it has been necessary for all of those bars to be of substantial construction, thus increasing the cost and complexity of such devices. Typical of these prior art devices include the following United States Patents: US-A-3 339 906 to Persson; US-A-3 826 457 to Huot de Longchamp; and US-A-4 125 242 to Meiller et al.

In accordance with the present invention there is provided a suspension system for maintaining two surfaces in generally spaced parallel relationship, comprising a support arm angularly displaceable to vary the separation of the two surfaces, the arm having means for movably coupling a first end thereof to one of the two surfaces, and means disposed at the second end of the arm for permitting angular displacement of said arm relative to the other of said two surfaces as the distance between the two surfaces changes; characterised in that the coupling means comprise a cam disposed at said first end of the arm, said cam having a larger arcuate surface and a smaller arcuate surface, and said cam surfaces defining an imaginary axis about which said cam pivots as the support arm is angularly displaced.

The suspension system of the invention provides a less expensive, more compact and comfortable seat suspension. It uses an independently operating support arm with a cam that moves about an imaginary pivot. A damping means that has a generally constant linear relationship to the vertical movement of the seat can also be incorporated.

One embodiment of the suspension system disclosed herein is enclosed in a suspension housing. The actual suspension function is provided by the primary support means that is the support arm that pivots inside the housing. In one preferred embodiment, a secondary support for the suspension housing typically comprises parallel scissor arms which guide the vertical movement of the housing and sustain a lesser amount of the forces generated by a load on the seat suspension. This occurs because suspension means, such as extension springs, are directly connected to the support arm and are not connected to the scissor arms. A height adjustment means is part of the support arm. Attached to the secondary support -- the scissor arms -- is a damping means such as a shock absorber.

With this construction it is possible to make a sturdy seat suspension capable of fitting the stringent dimensional constraints imposed by vehicle manufacturers. This is accomplished by the independence of the support arm from the scissor arms and its imaginary pivot defined by the two arcuate surfaces on the cam at the end of the support arm. Another advantageous feature of the seat suspension is that it can be disassembled quickly and easily. Thus, the suspension and ride characteristics can be easily modified by changing to different suspension springs and shock absorbers.

The described seat suspension also provides a comfortable ride. This is due to the physical independence of the suspension springs from the shock absorber, enabling a generally constant linear relationship between the vertical movement of the seat and the stroke travel of the damping means which results in a more comfortable ride throughout the operational range of movement of the suspension.

In the preferred embodiment, the location of the shock absorber is outside of the scissor arms, where it can be exposed to more freely circulating

air. Thus heat is dissipated from the shock absorber easily, permitting it to function more effectively and at the same time preventing it from wearing out as quickly as prior art devices.

A height adjustment mechanism is preferably incorporated into the support arm and requires no lever, trigger, or other means for vertically adjusting the seat suspension. Such features can be incorporated but sometimes are deemed undesirable. Adjustment is accomplished by pulling upwards on the top portion of the support housing, thus actuating a pivotable pawl and biasing spring that engage notches on the cam that establish various vertical positions.

Alternative embodiments of a more simply constructed suspension system than that described above are also possible and described herein. The strength and compactness of the support arm permit the construction of a suspension system without the scissor arms, the damping means, or the height ajdustment feature, although any one or more of these can be added. The suspension system comprises at least one moveable surface and includes the support arm with the cam having the two arcuate surfaces at one end. Cam follower means define the movement of the cam while a biasing means such as a spring or shock absorber controls the relative movement of the two surfaces that are maintained in spaced relation by the system.

A clear understanding of the invention will be gained by reference to the following description taken in connection with the accompanying drawings, in which:

Figure 1 depicts a driver sitting on a seat attached to the top of the mechanical seat suspension;

Figure 2 is a perspective view of a mechanical seat suspension constructed in accordance with the present invention and with external parts broken away for better illustration;

Figure 3 is an exploded view of the present invention;

Figure 4 is a plan view of the mechanical seat suspension;

Figure 5 is a side view in partial cross section along line 5 – 5 of Fig. 4 and shows the invention at its highest adjusted position;

Figure 6 is a side view in partial cross section, similar to Fig. 5, showing the mechanical seat suspension in its fully loaded or collapsed position with the imaginary pivot located outside of the device;

Figure 7 is a cross section along line 7 – 7 of Fig. 5 showing the independent scissor arms and support arm inside the housing, with the shock absorber on the outside of one scissor arm;

Figure 8 is an exploded view of the support arm showing in greater detail the cam and the height adjustment means;

Figure 9 depicts the height adjustment means in an unlatched position;

FIGURE 10 depicts the height adjustment means latched in an intermediate position;

FIGURE 11 shows the height adjustment means reengaged in a first latched position;

FIGURE 12 shows part of an unsatisfactory device in a raised position;

FIGURE 13 shows the unsatisfactory device in an impossibly collapsed position;

FIGURE 14 is a perspective view of a support arm; and

FIGURE 15 is a sectional view in elevation of another embodiment of the suspension system employing the support arm.

Detailed Description Of the Preferred Embodiment

Figure 1 generally depicts the mechanical seat suspension device 1. The device 1 is secured to a surface 2 in a vehicle (not shown) and can be covered by a seat 3 with pads or springs. The driver 4 sits upon the seat 3.

A general perspective of the present invention is shown in FIG. 2, while an exploded view of the device 1 is depicted in FIG. 3. Preliminarily the larger constituent parts of the device 1 will be discussed, after which the individual pieces will be examined in detail, and then the method of operation of the device 1 will be explained.

The housing for the device 1 consists of a lower portion 10 and upper portion 20. In this instance each portion is a solid plate with transversely bent or welded edges; however, a substantial framelike structure would also perform satisfactorily. Connected to the housing are parallel pairs of scissor arms 35, each pair being denoted 35A and 35B respectively. One end of the scissor arms 35 is connected to the upper and lower housings 10, 20 by shaft bearing tubes 36 and 38 welded to scissor arms 35. Threaded shafts 42 and 44 pass through holes 43 at the ends of lower and upper housings 10, 20 and the bearing tubes 36, 38. These shafts are secured at one end by nuts 46 (one shown) placed outside the housing.

The other end of scissor arms 35 are welded to rods 37 and 39. These rods 37, 39 are covered by nylon roller tips 40 that roll in channels 12 and 22 of the lower and upper housings 10 and 20 respectively.

It can be seen from this configuration that the larger components of the device can be easily disassembled from a complete structure. By removing the nuts 46 from the ends of the threaded

shafts 42 and 44, and then pulling the shafts 42, 44 free, the device will separate into the lower and upper housings 10, 20 and the scissor arms 35.

Other preferred features of the invention include ears 13 for attaching the upper housing 20 to a seat 3, and holes 14 for securing the lower housing 10 to a surface 2 in a vehicle. Also attached to the scissor arms 35 is a damping means, such as shock absorber 25. A dog 26 is welded to one of the scissor arms. Rod 27, attached to dog 26, passes though a journal 28 at one end of shock absorber 25 (Fig. 3). The other journal 28 of shock absorber 25 is pivotally engaged with rod 39 (FIG. 7). The journal ends 28 can be frictionally isolated from the scissor arm 35 by nylon or rubber washers 29 (FIG. 2).

When only the scissor arms 35 and the housings 10, 20 are assembled, there is no force to keep the upper and lower housings 20, 10 spaced apart, and thus without the shock absorber 25, just these peices would collapse under their own weight. That is to say, there is no horizontal force opposing roller tips 40 from sliding in channels 12, 22. In the assembled device 1, housings 10, 20 are connected to and spaced apart by a support arm assembly generally indicated as 60. One end of the support arm 60 pivots in brackets 70 on the underside of upper housing 20 and is connected to suspension means including springs 90. The other end of the support arm assembly 60 is welded to a transverse rod 62 with nylon end tips 64. These end tips 64 roll in channels 65 composed of steel plates welded to lower housing 10.

The support arm assembly 60 is preferably comprised of two separate pieces 60A and 60B as shown in Fig. 8. The curved end of the support arm assembly 60 fits between brackets 70. A spring shaft 92 passes through bracket slots 72 and support arm slots 65. One set of ends of springs 90 is operatively connected to spring shaft 92. The other ends of springs 90 are ultimately secured against movement by indirect connection to the upper housing 20.

The general concept depicted thus far establishes the independent mechanical operation of the support arm 60 and the scissor arms 35. The support arm assembly 60 ultimately engages the suspension means, springs 90. The scissor arms independently interact with the damping means, shock absorber 25. When a load is placed on the device 1, the rounded ends 61 of support arm assembly 60 roll or pivot against the underside of upper housing 20, thus pulling on suspension springs 90. Simultaneously the motion of the springs 90 are damped by shock absorber 25.

Thus the pivoting support arm 60 is the primary support means of the device. The scissor arms 35 are a secondary support means that function mostly as a guide means for the vertical motion of the upper housing 20. A structural analysis of the entire assembly when loaded would disclose that the scissor arms 35 do transmit some vertical and horizontal components of force, but those components are relatively small in comparison with the load sustained by the support arm assembly 60. Consequently, the scissor arms can be constructed of a less substantial and less costly amount of material than prior art devices.

The support arm assembly 60 is shown in exploded view in Fig. 8. The assembly comprises the elements necessary to interact with the suspension means and the elements making up the means to adjust the height of the device 1. Cam 80 fits between pieces 60A and 60B. Spring shaft 92 passes through slots 66, pieces 60A and 60B, and hole 81 in cam 80 to secure one end of cam 80 inside the support arm 60. Pin 83 passes through slots 67 in pieces 60A and 60B and cam hole 82. Biasing spring 85 is pinned (not shown) through the coil 87 of spring 85 between pieces 60A and 60B with spring angle 86 fitting in notch 69. Pawl 95 is secured between 60A and 60B by pin 96 (Fig. 9) through hole 97A, 97B.

On each outer side of support arm 60, spring end rollers 100 with circular notch 102 fit over each end of spring shaft 92 (FIG. 3). The rollers 100 are secured to the two ends of the shaft 92 by locking pins 104 (one shown). Springs 90 have curved ends 90A that fit in notch 102 (Fig. 4 in plan view). The ends of springs 90 connected to spring shaft 92 are moveable, as will be explained below. The fixed ends of springs 90 are curved ends 90A that loop over bar 110 that is part of the suspension spring adjustment mechanism.

As shown in FIG. 3, the spring adjustment mechanism consists of a threaded rod 112 threaded coupled to bar 110. The rod 112 extends through an aligning hole (not shown) in the upper housing 20. One end of the rod 112 is secured to a knob 114 outside of upper housing while the other end is threadably secured by washer 117 and nut 118 to plate 116 that abuts brackets 70. Consequently, when knob 114 turns threaded rob 112, bar 110 moves toward knob 114 or toward brackets 70. This adjusts the tension on springs 90. The force in the springs is ultimately transmitted to upper housing 20 by rod 112 and plate 116.

The functioning of the suspension system and its interaction with support arm 60 will now be described. One of the principal features of the device 1 is a so-called imaginary pivot that is the center of two concentric circles defined by arcuate surfaces 80A and 80B of cam 80(Fig. 9). These surfaces are always in contact with cylindrical cam followers 120 and 122 that are secured inside brackets 70 (FIG. 3). Each cam follower is rotatable

about a fixed axis. Referring to Figs. 5 – 7, when a vertical force A is applied to the upper housing 20, the entire support arm assembly moves in a pre – determined manner. Rollers 64 slide to the right (Fig. 5) in slots 65 (Fig. 7) and the left side of the support arm 60 and the cam 80 pivot coun – terclockwise (Fig. 5). This movement occurs be – cause cam followers 120 and 122 are fixed relative to the position of brackets 70 and upper housing 20. Because springs 90 are connected to spring shaft 92, and fixed relative to upper housing 20 by bar 110, springs 90 pull the cam 80 and the cam end of support arm 60 to the right. The downward movement of the upper housing 20, however, causes a counterclockwise rotation to the cam 80 in opposition to force A. As the cam 80 moves, so too does the imaginary pivot move vertically through space.

A comparison of Figures 5 and 6 demonstrates the circular movement of the cam 80 relative to the fixed locations of cam followers 120, 122. From the highest adjustment of the device 1 as shown in Fig. 5, force A has caused the cam 80 to rotate coun – terclockwise to the device's lowest position in Fig. 6. At the same time, roller 64 of support arm 60 has moved further to the right, thus permitting the compression of the device 1. It should also be noted that slots 72 in brackets 70 define the same concentric arc as do cam surface 80A and 80B moving against cam followers 120, 122. Thus, spring shaft 92 follows the same arcuate motion of the cam 80. It should be noted that Figures 5 and 6 represent two different height adjustments of the device 1. As will become clear below, the height adjustment mechanism of the seat does not change when the device 1 is loaded. Figures 5 and 6 simply represent the two extreme configurations of the present invention.

Figure 6 depicts the so – called imaginary piv – ot, which is defined by the intersection radii of the arcs defined by cam surfaces 80A and 80B. The pivot is not fixed, except with respect to the upper housing 20, and its location varies with the vertical movement of cam 80 and upper housing 20. As can be seen from Fig. 6, the imaginary pivot can be located outside the body of the device 1. This feature is responsible for the compactness of the present invention. In the present embodiment, the collapsed height in Fig. 6 is 3 inches, while the full height in Fig. 7 is approximately 9 inches.

Figures 12 and 13 show how a traditional con – figuration would require a greater height for the same device. To duplicate the performance of the present invention would require a scissor arm 330 with a force lever arm from pivot 300 to a point 310 collinear with spring 320. With this mechanical ar – rangement of Fig. 12, the completely collapsed configuration of Fig. 6 could not be achieved. This is demonstrated in Fig. 13, where the actual height H would be 5 inches, thus making it impossible to bring together upper and lower housings 20, 10. The few inches saved in the height of a mechanical seat suspension can mean the difference between meeting and not meeting the dimensional toleran – ces established by the equipment manufacturers who purchase such suspension devices. Tradi – tionally the suspension of a device is determined by the lever ratio, which represents the vertical displacement of the upper housing relative to the movement of the suspension spring. In the case of the present invention, the radii of curvature of the cam surfaces 80A and 80B are a result of the seat designer's predetermined choice of a lever ratio, which in the present device is 3:1.

The independence of the support arm 60 from shock absorber 25 not only permits a more effi – cient operation of each item, it also permits a generally constant linear relationship between the vertical travel of the upper housing 20 and shock absorber 25. This linearity results in a uniformity of performance of the seat, regardless of its load or height adjustment. The preferred ratio for the travel of the seat suspension to the stroke travel of the damping means is approximately 3.

The linear relationship between the upper housing 20 and the shock absorber 25 should not vary from complete linearity by more than 10 per – cent. This is because the two ends of the shock absorber move in a substantially linear relationship to each other as the scissor arms move. In the prior art devices, the shock absorber would be attached to the upper and lower housings. This would result in arcuate, non – linear motion, and thus the vertical component of the force applied to the shock absorber would diminish as the vertical height of the suspension decreased. Here the force in the shock absorber 25 is independent (within 10 percent) of the height of the seat, and is deter – mined only by the load on the seat.

The height of the dog 26 determines the length of stroke of the shock absorber 25. A maximum amount of stroke for the shock is desirable. The further away from the scissor arms pivot 35C the rod 27 is, the greater will be the stroke of the shock absorber 25. This in turn will lower the ratio between the displacement of the upper housing 20 and the shock 25. One of ordinary skill in the art will appreciate that it is not necessary for the lever ratio and shock ratio to be identical, and that such features are a result of the design requirements for a particular suspension device.

Figures 9, 10 and 11 depict the operation of the height adjustment means. In general, biasing spring 85 urges pawl 95 into locked engagement with one of a plurality of notches 150 on cam 80. The notches 150 are defined by a plurality of teeth

152 and pawl engaging tooth 154. The described embodiment of the present invention uses three notches, each representing a different height adjustment. Fewer or more notches can be used, and the disclosure of three height adjustments is merely by way of example.

Fig. 10 depicts the adjustment means at its intermediate height. Arrow X designates the force of springs 90 which, coupled with the biasing force from spring 85, maintains the tip of pawl 95 engaged with notch 150. To raise the height of the device 1 requires the application of a vertical force Y on spring shaft 92, which can be accomplished by an upward force exerted on upper housing 20 (not shown). This causes support arm 60 to pivot clockwise. Rollers 64 in channels 65 move to the left while the vertical force Y pulls the support arm 60 and cam 80 upward. This releases the locking force engaging pawl 95 and notch 150 so that as cam 80 is pulled upward pawl 95 slides over the tip of tooth 151 and into the adjacent right hand notch 150A (Fig. 10).

In the described embodiment, notch 150A represents the highest height adjustment. To lower the height of the device 1, additional vertical force is applied to the support arm 60 and cam 80 until pawl disengaging edge 195 contacts cam disengaging edge 180. As more upward force is applied pawl 95 pivots about pin 96. Thus the tip 295 of pawl 95 that contacts spring 85 moves from the tip 185 of spring 85 into notch 285. The tip of pawl 95 that engages notches 150 is moved beyond the arc that circumscribes teeth 151, and the height adjustment means is completely disengaged.

Reengagement of the height adjustment means requires a downward force to be applied to support arm 60 and cam 80. This is done by pushing down on the upper housing 20 (not shown Figs. 9 – 11), which rotates the support arm 60 counterclockwise as rollers 64 move to the right. This motion eventually causes the tip of pawl 95 to contact pawl engaging tooth 154, which is larger than teeth 151. When contact is first made tip 295 is still held in notch 285. Further downward force causes pawl 95 to pivot about pin 96 so pawl tip 295 is relocated to spring tip 185. This arrangement is depicted in Fig. 11, which shows the height adjustment means engaged in its first, or lowest, position.

It is important to note that the geometry of the biasing spring 85 and pawl 95 has a special configuration and purpose. When the height adjustment means is in any of the three positions, or anywhere in between, rear pawl tip 295 is always located at biasing spring tip 185 and being urged into engagement with notches 150. When the pawl 95 has become completely disengaged, as shown in Fig. 9, notch 285 urges pivotable pawl 95 to remain in continual disengagement, outside the arc of teeth 151, until reengaging tooth 154 engages pawl 95 into the first position. The detent means of pawl disengaging edge 195 and cam disengaging edge 180, by causing the rotation of the pawl 95, locates the pawl tip 295 with respect to spring tip 185 or spring notch 285.

Figure 14 is a perspective view of a simplified support arm 560 similar in concept to the support assembly 60 described above. Because no height adjustment mechanism is incorporated into the arm, it can be made as a single structural element. The support arm 560 includes a shaft 562. At one end of the shaft is can 580, with a larger arcuate surface 561 and a smaller arcuate surface 566. The arcuate surfaces define a center point C as depicted by the intersection of radii r_1 and r_2 in FIG. 15. At the opposite end of shaft 562 from cam 580 is a means 564 for permitting angular displacement of the support arm. Such means could consist merely of a solid rod 564 as shown in FIG. 14, which would slide on a surface. Alternatively the means for permitting angular displacement could be similar to the rollers 64 that slide in channels 65, as described earlier. Various other equivalents of the means for permitting angular displacement can easily be substituted. For example, the end of shaft 562 could merely be rounded for smooth sliding on a surface or could be a roller. The movement of the means 564 is generally parallel to the two surfaces being supported.

A means for operatively connecting the support arm 560 to the remainder of the suspension system can be accomplished in a variety of ways. Rod 592 can be secured to one end of a spring 500 as shown in FIG. 15. Other fastening equivalents such as slots, nuts, bolts, weldments, and the like are equally acceptable.

A practical but simplified version of a suspension system using the support arm 560 is depicted in FIG. 15. No height adjustment mechanism, scissor arms, or linear damping feature is present, although it is contemplated that any one or more of those elements could be added. Instead of scissor arms, the stability of plate 520 is ensured by rod 540 that travels in a pair of brackets with parallel slots 545 (one shown), which in turn is secured to surface 547. Alternatively, stability of the support arm and the suspension system can be assured by a pair of plates 570, which function similarly to brackets 70 disclosed above. Other means of stabilizing the suspension system are also contemplated, such as the above referenced rollers 64 and channels 65 or the use of two parallel support arms (not shown),.

Suspension spring 500 provides a biasing force to the system by resisting the rotation of support arm 560 as the cam follower means 522 and 523 guide the movement of cam 580. In this way the

support arm functions essentially as described in the more complex system. The spring 500, of course, can be fixed at one end 501 in various ways, such as through tab 510 attached to plate 520. It is also contemplated that the biasing means could alternatively comprise other hydraulic or mechanical services well known to those of skill in the art.

In FIG. 15 damping means 525 is a shock absorber shown in phantom whose location permits the depicted suspension system to collapse in much the same way as shown in FIG. 6. Depending upon the desired motion and force characteristics, as well as the dimensional and cost constraints, shock absorber 525 could be eliminated; or, it could be relocated to a vertical position between plate 520 and bottom surface 530 or other desirable positions.

As shown in FIG. 15, the simplified suspension system requires only one moveable surface or plate 520. Surface 530 could be a parallel element of the system, such as lower housing 10 described above, or it could simply be the flat floor of an operator's cab. Similarly, the suspension systems illustrated in the drawings can even be oriented 90 degrees to, for example, provide back support for a seat.

Of course, it should be understood that various changes and modifications to the preferred embodiments described herein will be apparent to those skilled in the art. Such changes and modifications can be made without departing from the scope of the present invention as defined by the appended claims and without diminishing its attendant advantages.

Claims

1. A suspension system for maintaining two surfaces in generally spaced parallel relationship, comprising a support arm (60; 560) angularly displaceable to vary the separation of the two surfaces, the arm having means (80; 580) for movably coupling a first end thereof to one of the two surfaces, and means (64) disposed at the second end of the arm for permitting angular displacement of said arm relative to the other of said two surfaces as the distance between the two surfaces changes; characterised in that the coupling means comprise a cam (80; 580) disposed at said first end of the arm, said cam having a larger arcuate surface (80B) and a smaller arcuate surface (80A), and said cam surfaces defining an imaginary pivot about which said cam pivots as the support arm is angularly displaced.

2. The suspension system of claim 1, including means fixed generally proximate to said first end of said arm (60; 560) for operatively connecting said arm to a suspension part fastened to one of the two surfaces.

3. The suspension system of claim 2 wherein said means for operatively connecting comprises a rod (95, 592) connected to a biasing device (90; 500) of the suspension system.

4. The suspension system of claim 1, 2 or 3 wherein said means for permitting angular displacement includes a surface (65; 530) guiding the second end of the arm to move generally parallel to the two surfaces.

5. The suspension system of claim 1, wherein said cam (80) further comprises means (150) for engaging a height adjustment mechanism (95).

6. The suspension system of claim 1 including cam follower means (120, 122; 522, 523) for cooperating with the cam surfaces and defining the movement of said cam (80; 580) as said two surfaces move relative to each other.

7. The suspension system of claim 6, including biasing means (90; 500) in operative engagement with said arm (60;560) for providing a suspension force in the suspension system.

8. The suspension system of claim 7, further comprising means (70; 570) for maintaining the stability of the suspension system.

9. The suspension system of claim 8, wherein said cam follower means (120, 122; 522, 523) are attached to said stabilizing means (70; 570).

10. The suspension system of claim 7, 8 or 9 further comprising means (95, 150) for adjusting the height of said suspension system.

11. The suspension system of any one of the preceding claims further comprising means (25; 525) for damping oscillatory motion of said suspension system.

Patentansprüche

1. Aufhängungseinrichtung zur Bildung zweier Flächen, die im wesentlichen in einer parallelen Anordnung zueinander beabstandet sind, die einen Trägerarm (60; 560), der winklig verschiebbar ist, um den Abstand der zwei