		3626934-$ or US-9827159-$ or US-4716890-$ or US-5140979-$ or US-3754548-$).did. or (US-6786878-$ or US-7238162-$ or US-7128722-$ or US-8951216-$ or US-5460597-$ or US-5417644-$ or US-6730050-$ or US-6432072-$ or US-5695451-$ or US-5475883-$ or US-5085207-$ or US-4162675-$ or US-4088128-$ or US-4079733-$ or US-3724451-$ or US-8342187-$ or US-7590445-$ or US-4730605-$ or US-7951098-$ or US-4025809-$ or US-3580246-$ or US-6228103-$ or US-9161881-$ or US-4566442-$ or US-5983416-$ or US-4722327-$ or US-7367981-$).did. or (US-5676637-$ or US-8777881-$ or US-4834075-$ or US-6500135-$ or US-3806980-$ or US-7503923-$ or US-5300095-$ or US-4841955-$ or US-6730051-$ or US-5843006-$ or US-3747594-$ or US-5214975-$ or US-5203113-$ or US-5640735-$ or US-5374237-$ or US-7996996-$ or US-9724771-$ or US-9606026-$ or US-7059425-$ or US-5655887-$ or US-3854563-$ or US-5573500-$ or US-3736920-$ or US-5088474-$ or US-9265689-$ or US-5803916-$ or US-6805700-$).did. or (US-6602211-$ or US-6997889-$ or US-4158246-$ or US-9289348-$ or US-5470303-$ or US-5159922-$ or US-9889066-$ or US-10027201-$ or US-8640347-$ or US-5212887-$ or US-5099705-$ or US-5079844-$ or US-3759020-$ or US-7036401-$ or US-3863342-$ or US-7818887-$ or US-RE36269-$ or US-5083376-$ or US-7448137-$ or US-6671969-$ or US-7096589-$ or US-5940977-$ or US-7127973-$ or US-8813377-$ or US-4976164-$ or US-8656598-$ or US-5170564-$).did. or (US-3971132-$ or US-6772662-$ or US-4272996-$ or US-3942251-$ or US-6212781-$ or US-7191847-$ or US-9192390-$ or US-5832611-$ or US-6264211-$ or US-7251896-$ or US-7370423-$ or US-4150668-$ or US-4817738-$ or US-6557816-$ or US-4563605-$ or US-5129118-$ or US-4420995-$ or US-9333628-$ or US-8475076-$ or US-7954402-$ or US-6971285-$ or US-6964216-$ or US-5660491-$ or US-2964037-$ or US-1882040-$).did. or (US-2964037-$ or US-1882040-$ or US-2902067-$ or US-2868248-$ or US-2822005-$ or US-2808082-$ or US-2240755-$ or US-3309932-$ or US-3545301-$ or US-3172675-$).did. or (EP-1313116-$ or WO-2009014727-$).did. or (JP-07051393-$ or JP-02019157-$ or JP-2005204777-$).did. or (WO-2015038005-$ or WO-2014118596-$ or JP-2010534110-$).did.				
S413	49	S412 and (balanc$)	US-PGPUB; USPAT; USOCR	OR	ON	2018/12/21 15:30

S414	9	S412 and (balanc$ with surface)	US-PGPUB; USPAT; USOCR	OR	ON	2018/12/21 15:32
S415	22	(a61h.cpcl.) and (balanc$ with surface)	EPO; JPO; DERWENT	OR	ON	2018/12/21 15:34
S416	17	S412 and (rest$3 with surface)	US-PGPUB; USPAT; USOCR	OR	ON	2018/12/21 15:36
S417	110	(a61h.cpcl.) and (rest$3 with surface)	EPO; JPO; DERWENT	OR	ON	2018/12/21 15:36
S418	2,863	(a61h.cpcl.) and (rest$3 with surface)	US-PGPUB; USPAT; USOCR	OR	ON	2018/12/21 15:39
S419	72	(a61h.cpcl.) and ((rest$3 with surface) same gravity)	US-PGPUB; USPAT; USOCR	OR	ON	2018/12/21 15:39
S420	158	(a61h.cpcl.) and (rest$3 with surface with force)	US-PGPUB; USPAT; USOCR	OR	ON	2018/12/21 15:40
S421	474	A61H1/00.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 08:54
S422	224	A61H1/006.cpc.	US-PGPUB; USPAT	OR	ON	2019/02/22 09:01

			; USOCR			
S423	926	A61H1/008.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:02
S424	702	A61H23/00.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:03
S425	121	A61H23/004.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:06
S426	213	A61H23/006.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:07
S427	1,689	A61H23/02.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:09
S428	721	A61H23/0218.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:10
S429	1,073	A61H23/0254.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:11
S430	1,453	A61H23/0263.cpc.	US-PGPUB; USPAT	OR	ON	2019/02/22 09:13

			; USOCR			
S431	592	A61H23/04.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:14
S432	113	A61H23/06.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:16
S433	78	A61H2023/002.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:17
S434	50	A61H2023/0209.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:18
S435	140	A61H2023/0272.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:20
S436	95	A61H2023/0281.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:23
S437	41	A61H2023/029.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:24
S438	136	A61H39/00.cpc.	US-PGPUB; USPAT	OR	ON	2019/02/22 09:25

			; USOCR			
S439	559	A61H39/002.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:26
S440	73	A61H39/007.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:27
S441	775	A61H39/04.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:28
S442	286	A61H2201/0165.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:29
S443	65	A61H2201/12.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:29
S444	730	A61H2201/1207.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:30
S445	1,553	A61H2201/1215.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:32
S446	47	A61H2201/1223.cpc.	US-PGPUB; USPAT	OR	ON	2019/02/22 09:33

			; USOCR			
S447	216	A61H2201/123.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:33
S448	0	A61H2201/12387.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:34
S449	749	A61H2201/1238.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:34
S450	151	A61H2201/14.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:34
S451	106	A61H2201/1409.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:35
S452	310	A61H2201/1418.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:43
S453	101	A61H2201/1481.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:43
S454	446	A61H2201/149.cpc.	US-PGPUB; USPAT	OR	ON	2019/02/22 09:44

			; USOCR			
S455	566	A61H2201/1664.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:44
S456	760	B23D51/16.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:45
S457	445	B23D49/162.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:45
S458	191	B23D49/165.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:47
S459	472	B26D7/2621.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:47
S460	0	A61B17/148.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:48
S461	478	A61B17/142.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:48
S462	33	B23D49/00.cpc.	US-PGPUB; USPAT	OR	ON	2019/02/22 09:49

			; USOCR			
S463	866	B23D49/007.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:49
S464	62	B23D49/008.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:50
S465	105	B23D49/10.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:50
S466	126	B23D49/16.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:51
S467	255	B23D49/167.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:52
S468	760	B23D51/16.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:52
S469	9	B27B19/00.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:53
S470	1	B27B19/002.cpc.	US-PGPUB; USPAT	OR	ON	2019/02/22 09:53

			; USOCR			
S471	300	B27B19/006.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:53
S472	48	B27B19/09.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:53
S473	30	B27B19/02.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:54
S474	0	B27B11/06.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/02/22 09:54
S475	489	A61H1/00.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 15:08
S476	232	A61H1/006.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 15:10
S477	956	A61H1/008.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 15:10
S478	719	A61H23/00.cpc.	US-PGPUB; USPAT	OR	ON	2019/05/25 15:11

			; USOCR			
S479	129	A61H23/004.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 15:12
S480	226	A61H23/006.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 15:12
S481	1,747	A61H23/02.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 15:13
S482	731	A61H23/0218.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 15:13
S483	1	"15920322"	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 16:15
S484	1,088	A61H23/0254.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 16:19
S485	1,470	A61H23/0263.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 16:21
S486	598	A61H23/04.cpc.	US-PGPUB; USPAT	OR	ON	2019/05/25 16:25

			; USOCR			
S487	112	A61H23/06.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 16:29
S488	80	A61H2023/002.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 16:33
S489	50	A61H2023/0209.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 16:42
S490	143	A61H2023/0272.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 16:42
S491	97	A61H2023/0281.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 16:42
S492	42	A61H2023/029.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 16:43
S493	139	A61H39/00.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 16:47
S494	573	A61H39/002.cpc.	US-PGPUB; USPAT	OR	ON	2019/05/25 16:47

			; USOCR			
S495	0	A61H39/0027.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 16:47
S496	80	A61H39/007.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 16:48
S497	798	A61H39/04.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 16:48
S498	302	A61H2201/0165.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 16:54
S499	68	A61H2201/12.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 16:54
S500	786	A61H2201/1207.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 16:57
S501	1,600	A61H2201/1215.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 16:58
S502	53	A61H2201/1223.cpc.	US-PGPUB; USPAT	OR	ON	2019/05/25 16:59

			; USOCR			
S503	231	A61H2201/123.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 17:00
S504	762	A61H2201/1238.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 17:00
S505	159	A61H2201/14.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 17:01
S506	115	A61H2201/1409.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 17:01
S507	318	A61H2201/1418.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 17:02
S508	103	A61H2201/1481.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 17:02
S509	464	A61H2201/149.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 17:02
S510	581	A61H2201/1664.cpc.	US-PGPUB; USPAT	OR	ON	2019/05/25 17:03

			; USOCR			
S511	768	B23D51/16.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 17:09
S512	449	B23D49/162.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 17:10
S513	191	B23D49/165.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 17:11
S514	477	B26D7/2621.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 17:11
S515	0	A61B17/148.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 17:21
S516	495	A61B17/142.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 17:21
S517	34	B23D49/00.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 17:23
S518	868	B23D49/007.cpc.	US-PGPUB; USPAT	OR	ON	2019/05/25 17:23

			; USOCR			
S519	62	B23D49/008.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 17:23
S520	105	B23D49/10.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 17:24
S521	127	B23D49/16.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 17:24
S522	256	B23D49/167.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 17:24
S523	768	B23D51/16.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 17:25
S524	9	B27B19/00.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 17:25
S525	2	B27B19/002.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 17:26
S526	312	B27B19/006.cpc.	US-PGPUB; USPAT	OR	ON	2019/05/25 17:26

			; USOCR			
S527	51	B27B19/09.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 17:26
S528	30	B27B19/02.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 17:27
S529	0	B27B11/06.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 17:27
S530	18	(a61h.cpcl. or "601".clas. or b23d.cpcl. or b27b.cpcl.) and ((containment (scotch adj yoke)) with (step$3))	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 18:10
S531	228	(a61h.cpcl. or "601".clas. or b23d.cpcl. or b27b.cpcl.) and (((containment with (bracket strut)) (scotch adj yoke)))	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/25 18:12
S538	227	(a61h.cpcl. or "601".clas. or b23d.cpcl. or b27b.cpcl.) and ((scotch adj yoke))	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/26 11:54
S539	201	S538 and @ad<="20180313"	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/26 11:57
S540	4	((scotch adj yoke) with (notch$ step$3) with (track guide containment))	US-PGPUB; USPAT	OR	ON	2019/05/26 12:07

			; USOCR			
S541	5	(TheraGun).as.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/26 14:51
S542	12	((("Wersland") near3 ("Jason"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/26 14:51
S543	6	((("Nazarian") near3 ("Benjamin"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/26 14:52
S544	10	((("Ensing") near3 ("Geert"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/26 14:52
S545	5	((("Li") near3 ("Guang") near3 ("Qing"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/26 14:52
S546	48	((("Firth") near3 ("Robert"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/26 14:52
S547	34	((("Linton") near3 ("Andrew"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/26 14:54
S548	170	((("Cooper") near3 ("Andrew"))).INV.	US-PGPUB; USPAT	OR	ON	2019/05/26 14:55

			; USOCR			
S549	107	((("Waldron") near3 ("Michael"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/26 15:00
S550	41	("20010016697" | "20030009116" | "20030094356" | "20030144615" | "20030195443" | "20060025710" | "20060123941" | "20060192527" | "20070144310" | "20070150004" | "20080103419" | "20120253245" | "20130133210" | "20130138023" | "20130261516" | "20130281897" | "20140180331" | "20150005682" | "20150148592" | "3172675" | "3545301" | "3626934" | "3942251" | "4150668" | "4173217" | "4549535" | "4566442" | "4730605" | "5085207" | "5212887" | "5417644" | "5569168" | "5573500" | "5951501" | "6228042" | "6663657" | "6682496" | "7927259" | "7996996" | "8342187" | "8951216").PN.	US-PGPUB; USPAT	OR	ON	2019/10/09 08:20
S551	1	("20150005682").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/10/09 08:28
S552	605	A61H1/00.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 08:42
S553	238	A61H1/006.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 08:43
S554	995	A61H1/008.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 08:43
S555	757	A61H23/00.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 08:44

S556	149	A61H23/004.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 08:47
S557	258	A61H23/006.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 08:47
S558	1,824	A61H23/02.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 08:48
S559	748	A61H23/0218.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 08:50
S560	1,111	A61H23/0254.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 08:51
S561	1,586	A61H23/0263.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 08:51
S562	610	A61H23/04.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 08:52
S563	114	A61H23/06.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 08:53

S564	86	A61H2023/002.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 08:53
S565	51	A61H2023/0209.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 08:53
S566	153	A61H2023/0272.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 08:54
S567	97	A61H2023/0281.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 08:55
S568	45	A61H2023/029.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 08:55
S569	150	A61H39/00.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 08:56
S570	597	A61H39/002.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 08:56
S571	86	A61H39/007.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 08:59

S572	826	A61H39/04.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 08:59
S573	327	A61H2201/0165.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 09:00
S574	76	A61H2201/12.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 09:01
S575	901	A61H2201/1207.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 11:13
S576	1,723	A61H2201/1215.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 11:19
S577	63	A61H2201/1223.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 11:20
S578	268	A61H2201/123.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 11:21
S579	802	A61H2201/1238.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 11:23

S580	184	A61H2201/14.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 11:23
S581	130	A61H2201/1409.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 11:24
S582	328	A61H2201/1418.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 11:25
S583	117	A61H2201/1481.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 11:25
S584	497	A61H2201/149.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 11:26
S585	618	A61H2201/1664.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 11:26
S586	783	B23D51/16.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 12:06
S587	457	B23D49/162.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 12:07

S588	191	B23D49/165.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 12:08
S589	34	B23D49/00.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 12:08
S590	872	B23D49/007.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 12:08
S591	62	B23D49/008.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 12:09
S592	119	B23D49/10.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 12:09
S593	132	B23D49/16.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 12:10
S594	260	B23D49/167.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 12:11
S595	478	B26D7/2621.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 12:11

S596	0	A61B17/148.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 12:12
S597	0	A61B17/0148.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 12:12
S598	368	A61B17/14.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 12:13
S599	520	A61B17/142.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 12:14
S600	12	B27B19/00.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 12:14
S601	5	B27B19/002.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 12:14
S602	324	B27B19/006.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 12:16
S603	51	B27B19/09.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 12:16

S604	33	B27B19/02.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 12:16
S605	1	"16357984"	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 12:20
S606	5	(("20030094356") or ("20070144310") or ("10027201") or ("20060260141") or ("20050178012")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/10/09 16:58
S607	1	("8322456").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/10/09 16:59
S608	114	("0066052" | "0661418" | "1324258" | "1806582" | "20020151262" | "20030015066" | "20030034164" | "20030042859" | "20030110645" | "20030190877" | "20030202851" | "20040069512" | "20040159172" | "20040211576" | "20050103510" | "20050127862" | "20050225183" | "20060123941" | "20060192527" | "20060213333" | "20060219059" | "20060220612" | "2106937" | "2155082" | "2348266" | "2414637" | "2546655" | "2791142" | "3109238" | "3427520" | "3475676" | "3477007" | "3904943" | "4267914" | "4296654" | "4332147" | "4347450" | "4463293" | "4527103" | "4528486" | "4544869" | "4554980" | "4581565" | "4677356" | "4705997" | "4816726" | "4901366" | "5122146" | "5149230" | "5165172" | "5177424" | "5251706" | "5309899" | "5327794" | "5331258" | "5332954" | "5365155" | "5410229" | "5428522" | "5533581" | "5563482" | "5784934" | "5889376" | "5892885" | "6102632" | "6105263" | "6296427" | "6307337" | "6364033" | "6461088" | "6479958" | "6528968" | "6617913" | "6687567" | "6702090" | "6741051" | "6749028" | "6929074" | "6938706" | "6973748" | "7055622" | "7064462" | "D377303" | "D414093" | "D444363" | "D458101" | "D479455").PN. OR ("8322456").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2019/10/09 16:59
S609	19	((("Wersland") near3 ("Jason"))).INV.	US-PGPUB;	OR	ON	2019/10/09 17:48

			USPAT ; USOCR			
S610	39	((("Linton") near3 ("Andrew"))).INV.	US-PGPUB ; USPAT ; USOCR	OR	ON	2019/10/10 16:21
S611	19	((("Wersland") near3 ("Jason"))).INV.	US-PGPUB ; USPAT ; USOCR	OR	ON	2019/10/10 16:21
S612	35	S610 not S611	US-PGPUB ; USPAT ; USOCR	OR	ON	2019/10/10 16:21
S613	179	((("Cooper") near3 ("Andrew"))).INV.	US-PGPUB ; USPAT ; USOCR	OR	ON	2019/10/10 16:22
S614	175	S613 not S611	US-PGPUB ; USPAT ; USOCR	OR	ON	2019/10/10 16:23
S615	120	((("Waldron") near3 ("Michael"))).INV.	US-PGPUB ; USPAT ; USOCR	OR	ON	2019/10/10 16:24
S616	0	S611 not S611	US-PGPUB ; USPAT ; USOCR	OR	ON	2019/10/10 16:24
S617	103	S615 not S611	US-PGPUB ; USPAT	OR	ON	2019/10/10 16:24

			; USOCR			
S618	673	A61H1/00.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 16:37
S619	244	A61H1/006.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 16:44
S620	1,016	A61H1/008.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 16:45
S621	773	A61H23/00.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 16:48
S622	152	A61H23/004.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 16:49
S623	280	A61H23/006.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 16:50
S624	1,877	A61H23/02.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 16:50
S625	757	A61H23/0218.cpc.	US-PGPUB; USPAT	OR	ON	2019/12/16 16:52

			; USOCR			
S626	1,134	A61H23/0254.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 16:52
S627	1,626	A61H23/0263.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 16:53
S628	618	A61H23/04.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 16:54
S629	115	A61H23/06.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 16:55
S630	88	A61H2023/002.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 16:56
S631	51	A61H2023/0209.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 16:56
S632	160	A61H2023/0272.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 16:57
S633	108	A61H2023/0281.cpc.	US-PGPUB; USPAT	OR	ON	2019/12/16 16:57

			; USOCR			
S634	45	A61H2023/029.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 16:58
S635	155	A61H39/00.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 16:59
S636	601	A61H39/002.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 16:59
S637	90	A61H39/007.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 17:00
S638	854	A61H39/04.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 17:01
S639	334	A61H2201/0165.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 17:02
S640	78	A61H2201/12.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 17:02
S641	957	A61H2201/1207.cpc.	US-PGPUB; USPAT	OR	ON	2019/12/16 17:03

			; USOCR			
S642	1,780	A61H2201/1215.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 17:03
S643	65	A61H2201/1223.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 17:04
S644	284	A61H2201/123.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 17:05
S645	833	A61H2201/1238.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 17:06
S646	197	A61H2201/14.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 17:07
S647	139	A61H2201/1409.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 17:08
S649	339	A61H2201/1418.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 17:09
S650	125	A61H2201/1481.cpc.	US-PGPUB; USPAT	OR	ON	2019/12/16 17:10

			; USOCR			
S651	509	A61H2201/149.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 17:12
S653	648	A61H2201/1664.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 17:12
S654	790	B23D51/16.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 17:13
S655	460	B23D49/162.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 17:14
S656	192	B23D49/165.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 17:15
S657	34	B23D49/00.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 17:15
S658	872	B23D49/007.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 17:17
S659	62	B23D49/008.cpc.	US-PGPUB; USPAT	OR	ON	2019/12/16 17:19

			; USOCR			
S660	120	B23D49/10.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 17:20
S661	133	B23D49/16.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 17:21
S662	261	B23D49/167.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 17:21
S663	482	B26D7/2621.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 17:22
S664	0	A61B17/148.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 17:23
S665	374	A61B17/14.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 17:24
S666	542	A61B17/142.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 17:25
S667	12	B27B19/00.cpc.	US-PGPUB; USPAT	OR	ON	2019/12/16 17:26

			; USOCR			
S668	5	B27B19/002.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 17:27
S669	335	B27B19/006.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 17:27
S670	52	B27B19/09.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 17:27
S671	33	B27B19/02.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 17:28
S672	0	B27B11/06.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/16 17:28
S673	4	"15458920"	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/17 09:01
S674	22	((("Wersland") near3 ("Jason"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/17 11:08
S675	15	(TheraGun).as.	US-PGPUB; USPAT	OR	ON	2019/12/17 11:19

			; USOCR			
S676	2	S675 not S674	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/17 11:19
S677	12	((("Nazarian") near3 ("Benjamin"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/17 11:20
S678	1	S677 not S674	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/17 11:21
S679	21	((("Ensing") near3 ("Geert"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/17 11:21
S680	2	S679 not S674	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/17 11:21
S681	7	((("Li") near3 ("Guang") near3 ("Qing"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/17 11:21
S682	3	S681 not S674	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/17 11:21
S683	56	((("Firth") near3 ("Robert"))).INV.	US-PGPUB; USPAT	OR	ON	2019/12/17 11:22

			; USOCR			
S684	52	S683 not S674	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/17 11:22
S685	42	((("Linton") near3 ("Andrew"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/17 11:22
S686	38	S685 not S674	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/17 11:23
S687	181	((("Cooper") near3 ("Andrew"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/17 11:23
S688	177	S687 not S674	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/17 11:23
S689	126	((("Waldron") near3 ("Michael"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/17 11:24
S690	107	S689 not S674	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/17 11:24
S691	4	(("7927259") or ("5212887") or ("20130133210") or ("20030094356")).PN.	US-PGPUB; USPAT	OR	OFF	2019/12/17 16:32

			; USOCR			
S692	267	(US-20140180331-$ or US-20130261516-$ or US-20130138023-$ or US-20120253245-$ or US-20080103419-$ or US-20070150004-$ or US-20060192527-$ or US-20060123941-$ or US-20060025710-$ or US-20030195443-$ or US-20030009116-$ or US-20010016697-$ or US-20160206502-$ or US-20160367425-$ or US-20170027798-$ or US-20030094356-$ or US-20170304145-$ or US-20140163442-$ or US-20130281897-$ or US-20120101517-$ or US-20100137907-$ or US-20100010399-$ or US-20090270915-$ or US-20090222024-$ or US-20020107459-$ or US-20170304144-$).did. or (US-20170156974-$ or US-20160346152-$ or US-20160271009-$ or US-20170156975-$ or US-20030149381-$ or US-20150202114-$ or US-20130012849-$ or US-20020072693-$ or US-20130123677-$ or US-20130072837-$ or US-20100331745-$ or US-20010027280-$ or US-20030028134-$ or US-20030065280-$ or US-20020183668-$ or US-20020082536-$ or US-20140323931-$ or US-20110137217-$ or US-20110041864-$ or US-20050113636-$ or US-20090038069-$ or US-20040064074-$ or US-20090086569-$ or US-20120253246-$ or US-20170281457-$ or US-20170105896-$ or US-20070299378-$).did. or (US-20100125228-$ or US-20060074362-$ or US-20170281459-$ or US-20040176710-$ or US-20150148592-$ or US-20080262397-$ or US-20100145242-$ or US-20030144615-$ or US-20090177128-$ or US-20170241201-$ or US-20150198219-$ or US-20090165387-$ or US-20070175647-$ or US-20050217900-$ or US-20050015030-$ or US-20100024571-$ or US-20150305973-$ or US-20160015596-$ or US-20150182411-$ or US-20160131228-$ or US-20090032275-$ or US-20030019799-$ or US-20130245511-$ or US-20040039314-$ or US-20070144310-$ or US-20180263845-$ or US-20150005682-$).did. or (US-20180200141-$ or US-20040255475-$ or US-20040255474-$ or US-20040187324-$ or US-20040117993-$ or US-20150367494-$ or US-20150033564-$ or US-20130133210-$ or US-20090100690-$ or US-20060260141-$ or US-20050178012-$ or US-20080047150-$ or US-20120192440-$ or US-20120030955-$ or US-20030070307-$ or US-20090272617-$ or US-20180099339-$ or US-20110265335-$ or US-20110131820-$ or US-	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2019/12/17 17:51

20080016705-$ or US-20070209217-$ or US-20190017528-$ or US-20190015294-$ or US-20130019483-$ or US-20150375315-$ or US-20110185582-$).did. or (US-20190224765-$ or US-20180236572-$ or US-20190209424-$ or US-20180370012-$).did. or (US-6663657-$ or US-6228042-$ or US-5951501-$ or US-5569168-$ or US-4549535-$ or US-4173217-$ or US-5273479-$ or US-8715161-$ or US-7927259-$ or US-7041072-$ or US-6733414-$ or US-6723060-$ or US-6682496-$ or US-6599260-$ or US-6352518-$ or US-6027444-$ or US-5716332-$ or US-4827914-$ or US-4790296-$ or US-4513737-$ or US-3837335-$ or US-3626934-$ or US-9827159-$ or US-4716890-$ or US-5140979-$ or US-3754548-$).did. or (US-6786878-$ or US-7238162-$ or US-7128722-$ or US-8951216-$ or US-5460597-$ or US-5417644-$ or US-6730050-$ or US-6432072-$ or US-5695451-$ or US-5475883-$ or US-5085207-$ or US-4162675-$ or US-4088128-$ or US-4079733-$ or US-3724451-$ or US-8342187-$ or US-7590445-$ or US-4730605-$ or US-7951098-$ or US-4025809-$ or US-3580246-$ or US-6228103-$ or US-9161881-$ or US-4566442-$ or US-5983416-$ or US-4722327-$ or US-7367981-$).did. or (US-5676637-$ or US-8777881-$ or US-4834075-$ or US-6500135-$ or US-3806980-$ or US-7503923-$ or US-5300095-$ or US-4841955-$ or US-6730051-$ or US-5843006-$ or US-3747594-$ or US-5214975-$ or US-5203113-$ or US-5640735-$ or US-5374237-$ or US-7996996-$ or US-9724771-$ or US-9606026-$ or US-7059425-$ or US-5655887-$ or US-3854563-$ or US-5573500-$ or US-3736920-$ or US-5088474-$ or US-9265689-$ or US-5803916-$ or US-6805700-$).did. or (US-6602211-$ or US-6997889-$ or US-4158246-$ or US-9289348-$ or US-5470303-$ or US-5159922-$ or US-9889066-$ or US-10027201-$ or US-8640347-$ or US-5212887-$ or US-5099705-$ or US-5079844-$ or US-3759020-$ or US-7036401-$ or US-3863342-$ or US-7818887-$ or US-RE36269-$ or US-5083376-$ or US-7448137-$ or US-6671969-$ or US-7096589-$ or US-5940977-$ or US-7127973-$ or US-8813377-$ or US-4976164-$ or US-8656598-$ or US-5170564-$).did. or (US-3971132-$ or US-6772662-$ or US-4272996-$ or US-3942251-$ or US-6212781-$ or US-7191847-$ or US-9192390-$ or US-5832611-$ or US-6264211-$ or US-7251896-$ or US-7370423-$ or US-4150668-$ or US-4817738-$ or US-6557816-$ or US-4563605-$ or US-5129118-$ or US-4420995-$ or US-9333628-$ or US-8475076-$ or US-7954402-$ or US-6971285-$ or US-6964216-$ or US-5660491-$ or US-2964037-$ or US-1882040-$ or US-8322456-$ or US-6938706-$).did. or (US-8561717-$ or US-10357425-$ or US-10428850-$ or US-10470970-$).did. or (US-2964037-$ or US-1882040-$ or US-2902067-$ or US-2868248-$ or US-2822005-$ or

		US-2808082-$ or US-2240755-$ or US-3309932-$ or US-3545301-$ or US-3172675-$).did. or (EP-1313116-$ or WO-2009014727-$).did. or (JP-07051393-$ or JP-02019157-$ or JP-2005204777-$).did. or (WO-2015038005-$ or WO-2014118596-$ or JP-2010534110-$).did.				
S693	98	S692 and (battery)	US-PGPUB; USPAT; USOCR	OR	ON	2019/12/17 17:52
S694	7	(("7927259") or ("5212887") or ("20130133210") or ("20030094356") or ("20180236572") or ("20070150004") or ("20150375315")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/12/18 07:50
S695	0	"16675772"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/16 10:12
S696	1	("20190017528").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2020/01/16 12:24
S697	4	"15458920"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/16 15:58
S698	522	A61H1/00.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/16 16:03
S699	217	A61H1/006.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 08:44

S700	883	A61H1/008.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 08:57
S701	699	A61H23/00.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 09:06
S702	139	A61H23/004.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 09:14
S703	240	A61H23/006.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 10:00
S704	1,663	A61H23/02.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 10:03
S705	0	A61H23/00218.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 10:14
S706	426	A61H23/0218.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 10:14
S707	714	A61H23/0254.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 10:16

S708	1,308	A61H23/0263.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 10:24
S709	487	A61H23/04.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 10:34
S710	70	A61H23/06.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 10:38
S711	83	A61H2023/002.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 10:40
S712	47	A61H2023/0209.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 10:41
S713	127	A61H2023/0272.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 10:43
S714	58	A61H2023/0281.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 10:43
S715	40	A61H2023/029.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 10:44

S716	144	A61H39/00.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 10:46
S717	562	A61H39/002.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 10:57
S718	86	A61H39/007.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 11:00
S719	817	A61H39/04.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 11:00
S720	291	A61H2201/0165.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 11:09
S721	71	A61H2201/12.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 11:24
S722	841	A61H2201/1207.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 11:24
S723	1,605	A61H2201/1215.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 11:30

S724	57	A61H2201/1223.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 11:51
S725	248	A61H2201/123.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 11:54
S726	722	A61H2201/1238.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 11:57
S727	163	A61H2201/14.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 12:03
S728	120	A61H2201/1409.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 12:06
S729	264	A61H2201/1418.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 12:08
S730	117	A61H2201/1481.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 12:12
S731	464	A61H2201/149.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 12:12

S732	604	A61H2201/1664.cpc. and @ad<="20180404"	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 12:17
S733	792	B23D51/16.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 12:30
S734	172	S733 and (balanc$ (rest$3 adj surface) (flat$5 near5 upright))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 12:54
S735	217	S733 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 12:57
S736	2	S733 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 12:58
S737	153	S733 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 13:04
S738	464	B23D49/162.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 13:24
S739	0	S738 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 13:24

S740	106	S738 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 13:24
S741	115	S738 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 13:24
S742	192	B23D49/165.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 13:32
S743	0	S742 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 13:32
S744	54	S742 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 13:32
S745	78	S742 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 13:32
S746	34	B23D49/00.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 14:59
S747	873	B23D49/007.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:07

S748	0	S747 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:07
S749	72	S747 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:07
S750	17	S747 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:07
S751	62	B23D49/008.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:09
S752	122	B23D49/10.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:10
S753	134	B23D49/16.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:13
S754	0	B23D49/1674.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:17
S755	261	B23D49/167.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:17

S756	0	S755 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:17
S757	95	S755 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:17
S758	50	S755 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:17
S759	486	B26D7/2621.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:22
S760	0	S759 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:22
S761	104	S759 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:22
S762	29	S759 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:22
S763	1,439	B26D7/2614.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:27

S764	5	S763 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:27
S765	529	S763 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:27
S766	79	S763 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:28
S767	305	B26D5/14.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:31
S768	3	S767 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:31
S769	93	S767 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:32
S770	68	S767 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:32
S771	0	A61B17/148.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:33

S772	545	A61B17/142.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:41
S773	0	S772 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:41
S774	185	S772 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:41
S775	38	S772 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:42
S776	376	A61B17/14.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:43
S777	1	S776 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:43
S778	150	S776 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:43
S779	55	S776 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:44

S780	204	A61B17/144.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:58
S781	0	S780 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:58
S782	76	S780 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:58
S783	31	S780 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 15:58
S784	12	B27B19/00.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:11
S785	5	B27B19/002.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:14
S786	336	B27B19/006.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:14
S787	1	S786 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:14

S788	112	S786 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:15
S789	52	B27B19/09.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:35
S790	33	B27B19/02.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:38
S791	0	B27B11/06.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:40
S792	0	B27B11/06.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:44
S793	143	83/615.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:44
S794	476	83/623.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:46
S795	0	S794 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:46

S796	72	S794 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:46
S797	43	S794 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:46
S798	516	83/632.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:47
S799	0	S798 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:47
S800	44	S798 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:47
S801	31	S798 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:48
S802	239	83/62.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:49
S803	196	83/626.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:49

S804	0	S803 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:49
S805	18	S803 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:49
S806	15	S803 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:49
S807	247	83/427.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:50
S808	0	S807 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:50
S809	24	S807 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:50
S810	18	S807 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:50
S811	931	30/392.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:52

S812	2	S811 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:52
S813	318	S811 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:52
S814	180	S811 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 16:52
S815	189	30/393.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 17:34
S816	1	S815 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 17:34
S817	50	S815 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 17:34
S818	64	S815 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/17 17:34
S819	315	30/394.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:14

S820	1	S819 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:14
S821	71	S819 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:15
S822	76	S819 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:15
S823	224	30/182.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:21
S824	0	S823 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:21
S825	35	S823 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:21
S826	5	S823 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:22
S827	171	30/208.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:23

S828	0	S827 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:23
S829	549	30/241.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:24
S830	0	S829 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:25
S831	105	S829 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:25
S832	23	S829 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:25
S833	43	30/217.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:27
S834	170	30/218.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:27
S835	207	30/219.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:28

S836	267	30/220.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:35
S837	0	S836 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:35
S838	49	S836 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:35
S839	27	S836 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:36
S840	160	30/242.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:38
S841	394	173/49.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:39
S842	0	S841 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:40
S843	47	S841 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:40

S844	52	S841 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:40
S845	181	173/144.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:41
S846	304	173/114.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:41
S847	0	S846 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:41
S848	44	S846 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:41
S849	30	S846 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:42
S850	592	173/122.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:44
S851	1	S850 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:45

S852	86	S850 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:46
S853	49	S850 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:46
S854	459	173/205.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:48
S855	0	S854 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:48
S856	83	S854 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:48
S857	72	S854 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:49
S858	771	227/131.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:55
S859	10	S858 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:55

S860	269	S858 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:55
S861	91	S858 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 12:55
S862	754	D8/8.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:02
S863	0	S862 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:02
S864	32	S862 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:02
S865	3	S862 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:03
S866	906	D8/61.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:29
S867	0	S866 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:29

S868	33	S866 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:29
S869	4	S868 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:29
S870	325	D8/64.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:30
S871	0	S870 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:30
S872	11	S870 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:30
S873	2	S870 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:31
S874	191	144/121.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:31
S875	0	S874 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:31

S876	4	S874 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:31
S877	2	S874 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:31
S878	50	144/122.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:32
S879	165	144/147.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:32
S880	588	125/16.01.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:34
S881	1	S880 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:34
S882	41	S880 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:34
S883	32	S880 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:34

S884	566	76/31.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:37
S885	0	S884 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:37
S886	75	S884 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:37
S887	3	S884 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:37
S888	339	76/36.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:39
S889	0	S888 and ((housing handle frame) with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:39
S890	70	S888 and ((hold$3 grasp$ handle) with (position))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:40
S891	2	S888 and (pinion (pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:40

S892	235	601/97.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:50
S893	256	601/107.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 13:51
S894	324	(US-20140180331-$ or US-20130261516-$ or US-20130138023-$ or US-20120253245-$ or US-20080103419-$ or US-20070150004-$ or US-20060192527-$ or US-20060123941-$ or US-20060025710-$ or US-20030195443-$ or US-20030009116-$ or US-20010016697-$ or US-20160206502-$ or US-20160367425-$ or US-20170027798-$ or US-20030094356-$ or US-20170304145-$ or US-20140163442-$ or US-20130281897-$ or US-20120101517-$ or US-20100137907-$ or US-20100010399-$ or US-20090270915-$ or US-20090222024-$ or US-20020107459-$ or US-20170304144-$).did. or (US-20170156974-$ or US-20160346152-$ or US-20160271009-$ or US-20170156975-$ or US-20030149381-$ or US-20150202114-$ or US-20130012849-$ or US-20020072693-$ or US-20130123677-$ or US-20130072837-$ or US-20100331745-$ or US-20010027280-$ or US-20030028134-$ or US-20030065280-$ or US-20020183668-$ or US-20020082536-$ or US-20140323931-$ or US-20110137217-$ or US-20110041864-$ or US-20050113636-$ or US-20090038069-$ or US-20040064074-$ or US-20090086569-$ or US-20120253246-$ or US-20170281457-$ or US-20170105896-$ or US-20070299378-$).did. or (US-20100125228-$ or US-20060074362-$ or US-20170281459-$ or US-20040176710-$ or US-20150148592-$ or US-20080262397-$ or US-20100145242-$ or US-20030144615-$ or US-20090177128-$ or US-20170241201-$ or US-20150198219-$ or US-20090165387-$ or US-20070175647-$ or US-20050217900-$ or US-20050015030-$ or US-20100024571-$ or US-20150305973-$ or US-20160015596-$ or US-20150182411-$ or US-20160131228-$ or US-20090032275-$ or US-20030019799-$ or US-20130245511-$ or US-20040039314-$ or US-20070144310-$ or US-20180263845-$ or US-20150005682-$).did. or (US-	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2020/01/18 14:06

20180200141-$ or US-20040255475-$ or US-
20040255474-$ or US-20040187324-$ or US-
20040117993-$ or US-20150367494-$ or US-
20150033564-$ or US-20130133210-$ or US-
20090100690-$ or US-20060260141-$ or US-
20050178012-$ or US-20080047150-$ or US-
20120192440-$ or US-20120030955-$ or US-
20030070307-$ or US-20090272617-$ or US-
20180099339-$ or US-20110265335-$ or US-
20110131820-$ or US-20060288594-$ or US-
20080016705-$ or US-20070209217-$ or US-
20190017528-$ or US-20190015294-$ or US-
20130019483-$ or US-20150375315-$ or US-
20110185582-$).did. or (US-20190224765-$ or US-
20180236572-$ or US-20190209424-$ or US-
20180370012-$ or US-20190254921-$ or US-
20060047315-$ or US-20050131461-$ or US-
20020082532-$ or US-20180031089-$ or US-
20190175434-$ or US-20080004554-$ or US-
20050159689-$ or US-20170079865-$ or US-
20190083352-$ or US-20140283394-$ or US-
20170361386-$ or US-20170173711-$ or US-
20140182871-$ or US-20090188119-$ or US-
20080189961-$ or US-20050126018-$ or US-
20010011420-$ or US-20020138991-$ or US-
20190351539-$ or US-20160199924-$ or US-
20100162579-$ or US-20130014968-$).did. or (US-
20080229591-$ or US-20050257385-$ or US-
20050257384-$ or US-20110107608-$ or US-
20140360335-$ or US-20130204255-$ or US-
20090326540-$ or US-20050252011-$ or US-
20150113815-$ or US-20140007436-$ or US-
20070289149-$ or US-20050262710-$).did. or (US-
6663657-$ or US-6228042-$ or US-5951501-$ or US-
5569168-$ or US-4549535-$ or US-4173217-$ or US-
5273479-$ or US-8715161-$ or US-7927259-$ or US-
7041072-$ or US-6733414-$ or US-6723060-$ or US-
6682496-$ or US-6599260-$ or US-6352518-$ or US-
6027444-$ or US-5716332-$ or US-4827914-$ or US-
4790296-$ or US-4513737-$ or US-3837335-$ or US-
3626934-$ or US-9827159-$ or US-4716890-$ or US-
5140979-$ or US-3754548-$).did. or (US-6786878-$ or
US-7238162-$ or US-7128722-$ or US-8951216-$ or US-
5460597-$ or US-5417644-$ or US-6730050-$ or US-
6432072-$ or US-5695451-$ or US-5475883-$ or US-
5085207-$ or US-4162675-$ or US-4088128-$ or US-
4079733-$ or US-3724451-$ or US-8342187-$ or US-
7590445-$ or US-4730605-$ or US-7951098-$ or US-
4025809-$ or US-3580246-$ or US-6228103-$ or US-
9161881-$ or US-4566442-$ or US-5983416-$ or US-
4722327-$ or US-7367981-$).did. or (US-5676637-$ or
US-8777881-$ or US-4834075-$ or US-6500135-$ or US-
3806980-$ or US-7503923-$ or US-5300095-$ or US-

		4841955-$ or US-6730051-$ or US-5843006-$ or US-3747594-$ or US-5214975-$ or US-5203113-$ or US-5640735-$ or US-5374237-$ or US-7996996-$ or US-9724771-$ or US-9606026-$ or US-7059425-$ or US-5655887-$ or US-3854563-$ or US-5573500-$ or US-3736920-$ or US-5088474-$ or US-9265689-$ or US-5803916-$ or US-6805700-$).did. or (US-6602211-$ or US-6997889-$ or US-4158246-$ or US-9289348-$ or US-5470303-$ or US-5159922-$ or US-9889066-$ or US-10027201-$ or US-8640347-$ or US-5212887-$ or US-5099705-$ or US-5079844-$ or US-3759020-$ or US-7036401-$ or US-3863342-$ or US-7818887-$ or US-RE36269-$ or US-5083376-$ or US-7448137-$ or US-6671969-$ or US-7096589-$ or US-5940977-$ or US-7127973-$ or US-8813377-$ or US-4976164-$ or US-8656598-$ or US-5170564-$).did. or (US-3971132-$ or US-6772662-$ or US-4272996-$ or US-3942251-$ or US-6212781-$ or US-7191847-$ or US-9192390-$ or US-5832611-$ or US-6264211-$ or US-7251896-$ or US-7370423-$ or US-4150668-$ or US-4817738-$ or US-6557816-$ or US-4563605-$ or US-5129118-$ or US-4420995-$ or US-9333628-$ or US-8475076-$ or US-7954402-$ or US-6971285-$ or US-6964216-$ or US-5660491-$ or US-2964037-$ or US-1882040-$ or US-8322456-$ or US-6938706-$).did. or (US-8561717-$ or US-10357425-$ or US-10428850-$ or US-10470970-$ or US-4283855-$ or US-10525541-$ or US-3876015-$ or US-3834019-$ or US-3805383-$ or US-6357124-$ or US-4240204-$ or US-7509744-$ or US-5007172-$ or US-3706474-$ or US-4991298-$ or US-8960323-$ or US-8578615-$ or US-6282797-$ or US-6634107-$ or US-6662455-$ or US-6758119-$ or US-3785053-$).did. or (US-2964037-$ or US-1882040-$ or US-2902067-$ or US-2868248-$ or US-2822005-$ or US-2808082-$ or US-2240755-$ or US-3309932-$ or US-3545301-$ or US-3172675-$ or US-2839101-$ or US-3050093-$ or US-3340612-$ or US-3623223-$).did. or (EP-1313116-$ or WO-2009014727-$).did. or (JP-07051393-$ or JP-02019157-$ or JP-2005204777-$).did. or (WO-2015038005-$ or WO-2014118596-$ or JP-2010534110-$).did.				
S895	11	S894 and ((pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 14:10
S896	51	S894 and ((switch button trigger) with (PCB circuit electronic$ processor))	US-PGPUB; USPAT	OR	ON	2020/01/18 14:18

			; USOCR			
S897	32	S896 and (battery)	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 14:21
S898	19	S896 and (pivot pivoting)	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 15:33
S899	20	S896 and (pivot pivoting pivotabl$ pivoted)	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 15:34
S900	132	S894 and (pivot pivoting pivotabl$ pivoted)	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 15:43
S901	2	((pushrod push-rod (push adj rod))) same ((pivot pivoting pivotabl$ pivoted) with pin) same (adapter) same (socket pocket) same (protrusion projection)	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 16:35
S902	73	((pushrod push-rod (push adj rod))) same ((pivot pivoting pivotabl$ pivoted) with pin) same (socket pocket) same (protrusion projection)	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 16:35
S903	230	S894 and (motor same (shaft axle))	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 16:53
S904	1	("9221112").PN.	US-PGPUB; USPAT	OR	OFF	2020/01/18 17:24

			; USOCR			
S905	48	("20040064907" | "20040074025" | "20040232194" | "20070180711" | "20080017689" | "20080048000" | "20090236387" | "20090250500" | "20100162579" | "20100213236" | "20100276168" | "2373842" | "2726689" | "2894489" | "3939599" | "4081704" | "4323127" | "5246414" | "5479709" | "5558166" | "5581891" | "5624000" | "5692421" | "5960687" | "6520397" | "6619527" | "6935547" | "6971951" | "7011243" | "7040520" | "7107670" | "7107944" | "7109613" | "7117582" | "7118018" | "7140331" | "7305941" | "7513845" | "7568602" | "7690283" | "7703856" | "7850145" | "7938305" | "7959415" | "RE40643").PN. OR ("9221112").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 17:24
S906	15	(Theragun).as.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 17:42
S907	0	((("McCaslin") near3 ("Chris"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 17:43
S908	0	((("McCaslin") near3 ("Chris"))).INV.	EPO; JPO; DERWENT	OR	ON	2020/01/18 17:46
S909	146	((("Parker") near3 ("Anthony"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 17:46
S910	45	((("Parker") near3 ("Anthony"))).INV.	EPO; JPO; DERWENT	OR	ON	2020/01/18 17:48
S911	24	((("Quintus-Bosz") near3 ("Harald"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 17:50

S912	2	((("Quintus-Bosz") near3 ("Harald"))).INV.	EPO; JPO; DERWENT	OR	ON	2020/01/18 17:51
S913	3	((("Solana") near3 ("Jaime") near3 ("Sanchez"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 17:55
S914	0	((("Solana") near3 ("Jaime") near3 ("Sanchez"))).INV.	EPO; JPO; DERWENT	OR	ON	2020/01/18 17:56
S915	12	((("Nazarian") near3 ("Benjamin"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 17:56
S916	0	((("Nazarian") near3 ("Benjamin"))).INV.	EPO; JPO; DERWENT	OR	ON	2020/01/18 18:00
S917	0	((("Wersland") near3 ("Jason"))).INV.	EPO; JPO; DERWENT	OR	ON	2020/01/18 18:00
S918	22	((("Wersland") near3 ("Jason"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2020/01/18 18:01
S919	0	"16796143"	US-PGPUB; USPAT; USOCR	OR	ON	2020/04/20 11:52
S920	0	"16869389"	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/07 09:08
S921	1	("20190017528").PN.	US-PGPUB;	OR	OFF	2020/07/07 15:10

			USPAT; USOCR			
S922	44	("10314762" | "20010016697" | "20030009116" | "20030094356" | "20030144615" | "20030195443" | "20060025710" | "20060123941" | "20060192527" | "20070144310" | "20070150004" | "20080103419" | "20120253245" | "20130133210" | "20130138023" | "20130261516" | "20130281897" | "20140180331" | "20150005682" | "20150148592" | "20150375315" | "20180236572" | "3172675" | "3545301" | "3626934" | "3942251" | "4150668" | "4173217" | "4549535" | "4566442" | "4730605" | "5085207" | "5212887" | "5417644" | "5569168" | "5573500" | "5951501" | "6228042" | "6663657" | "6682496" | "7927259" | "7996996" | "8342187" | "8951216").PN.	US-PGPUB; USPAT	OR	ON	2020/07/07 15:18
S923	0	JP-201535844-$.did.	EPO; JPO; DERWENT	OR	ON	2020/07/07 15:35
S924	2	JP-2015035844-$.did.	EPO; JPO; DERWENT	OR	ON	2020/07/07 15:35
S925	5	(("3545301") or ("3172675") or ("9543871")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2020/07/07 15:35
S926	8	(("6228042") or ("20140180331") or ("4173217") or ("20080103419") or ("20030195443") or ("5569168") or ("6663657") or ("4549535")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2020/07/07 15:37
S927	0	JP-003077837-$.did.	EPO; JPO; DERWENT	OR	ON	2020/07/07 16:18
S928	0	JP-3077837-$.did.	EPO; JPO; DERWENT	OR	ON	2020/07/07 16:18
S929	2	JP-03077837-$.did.	EPO; JPO; DERWENT	OR	ON	2020/07/07 16:19

S930	0	JP-3077837-U.did.	EPO; JPO; DERWENT	OR	ON	2020/07/07 16:19
S931	36	((("Wersland") near3 ("Jason"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/07 16:21
S932	0	"16796143"	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/07 17:06
S933	907	A61H1/00.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 10:00
S934	25	S933 and (brushless near3 motor)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 10:29
S935	14	S933 and (haptic$ with (instruct$4 feedback$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 10:31
S936	28	S933 and (((software phone smartphone smart-phone) near3 (app application)) with (control$4 routine protocol instruction))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 10:34
S937	8	S933 and (motor adj mount)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 10:34
S938	5	S933 and ((frame handle) with shape with (triangl$))	US-PGPUB;	OR	ON	2020/07/09 10:38

			USPAT ; USOCR			
S939	23	S933 and (target near3 (force pressure))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 10:39
S940	523	S933 and ((control$4 routine protocol instruction) with (duration time intensity force pressure direction path frequency amplitude))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 10:41
S941	219	S933 and ((sensor monitor$ sensing) near3 (force pressure))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 10:41
S942	112	S933 and (((sensor monitor$ sensing) near3 (force pressure)) with (feedback control$4))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 10:44
S943	122	S933 and ((routine protocol instruction) with (duration time intensity force pressure direction path frequency amplitude))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 10:48
S944	272	A61H1/006.cpc.	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 10:52
S945	12	S944 and (brushless near3 motor)	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 10:52
S946	0	S944 and (haptic$ with (instruct$4 feedback$))	US-PGPUB ; USPAT	OR	ON	2020/07/09 10:52

			; USOCR			
S947	13	S944 and (((software phone smartphone smart-phone) near3 (app application)) with (control$4 routine protocol instruction))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 10:52
S948	0	S944 and (motor adj mount)	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 10:54
S949	0	S944 and ((frame handle) with shape with (triangl$))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 10:54
S950	10	S944 and (target near3 (force pressure))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 10:54
S951	40	S944 and ((routine protocol instruction) with (duration time intensity force pressure direction path frequency amplitude))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 10:55
S952	40	S944 and (((meter sensor monitor$ sensing) near3 (force pressure)) with (feedback control$4))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 10:56
S953	1,088	A61H1/008.cpc.	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 10:57
S954	16	S953 and (brushless near3 motor)	US-PGPUB ; USPAT	OR	ON	2020/07/09 10:57

			; USOCR			
S955	4	S953 and (haptic$ with (instruct$4 feedback$))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 11:13
S956	20	S953 and (((software phone smartphone smart-phone) near3 (app application)) with (control$4 routine protocol instruction))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 11:15
S957	7	S953 and (motor adj mount)	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 11:19
S958	0	S953 and ((frame handle) with shape with (triangl$))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 11:19
S959	60	S953 and (target near3 (force pressure))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 11:20
S960	152	S953 and ((routine protocol instruction) with (duration time intensity force pressure direction path frequency amplitude))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 11:23
S961	84	S953 and (((meter sensor monitor$ sensing) near3 (force pressure)) with (feedback control$4))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 11:27
S962	840	A61H23/00.cpc.	US-PGPUB ; USPAT	OR	ON	2020/07/09 11:29

			; USOCR			
S963	17	S962 and (brushless near3 motor)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 11:29
S964	28	S962 and (haptic$ with (instruct$4 feedback$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 11:32
S965	31	S962 and (((software phone smartphone smart-phone) near3 (app application)) with (control$4 routine protocol instruction))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 11:36
S966	19	S962 and (motor adj mount)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 11:39
S967	0	S962 and ((frame handle) with shape with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 11:39
S968	50	S962 and (target near3 (force pressure))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 11:41
S969	124	S962 and ((routine protocol instruction) with (duration time intensity force pressure direction path frequency amplitude))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 11:44
S970	95	S962 and (((meter sensor monitor$ sensing) near3 (force pressure)) with (feedback control$4))	US-PGPUB; USPAT	OR	ON	2020/07/09 12:19

			; USOCR			
S971	173	A61H23/004.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 12:22
S972	2	S971 and (brushless near3 motor)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 12:22
S973	6	S971 and (haptic$ with (instruct$4 feedback$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 12:22
S974	8	S971 and (((software phone smartphone smart-phone) near3 (app application)) with (control$4 routine protocol instruction))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 12:24
S975	0	S971 and (motor adj mount)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 12:29
S976	0	S971 and ((frame handle) with shape with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 12:29
S977	4	S971 and (target near3 (force pressure))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 12:30
S978	24	S971 and ((routine protocol instruction) with (duration time intensity force pressure direction path frequency amplitude))	US-PGPUB; USPAT	OR	ON	2020/07/09 12:30

			; USOCR			
S979	14	S971 and (((meter sensor monitor$ sensing) near3 (force pressure)) with (feedback control$4))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 12:31
S980	5,668	A61H23/006,02,0218,0254,0263,04,06.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 12:33
S981	91	S980 and (brushless near3 motor)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 12:33
S982	82	S980 and (haptic$ with (instruct$4 feedback$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 12:39
S983	264	S980 and (((software phone smartphone smart-phone) near3 (app application)) with (control$4 routine protocol instruction))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 12:43
S984	92	S980 and (motor adj mount)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 13:04
S985	25	S980 and ((frame handle) with shape with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 13:33
S986	102	S980 and (target near3 (force pressure))	US-PGPUB; USPAT	OR	ON	2020/07/09 13:36

			; USOCR			
S987	139	S980 and ((target$3 desired) near3 (force pressure))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 13:38
S988	604	S980 and ((routine protocol instruction) with (duration time intensity force pressure direction path frequency amplitude))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 13:46
S989	543	S988 and (vibrat$ percussion percussive)	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 13:49
S990	46	S988 and (percussion percussive)	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 13:49
S991	188	S980 and (((routine protocol instruction) with (duration time intensity force pressure direction path frequency amplitude)) same (vibrat$ percussion percussive))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 13:49
S992	401	S980 and (((meter sensor monitor$ sensing) near3 (force pressure)) with (feedback control$4))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 13:57
S993	115	S980 and ((((meter sensor monitor$ sensing) near3 (force pressure)) with (feedback control$4)) same (vibrat$ percussion percussive))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 13:58
S994	439	A61H2023/002,0209,0272,0281,029.cpc.	US-PGPUB ; USPAT	OR	ON	2020/07/09 14:00

			; USOCR			
S995	20	S994 and (brushless near3 motor)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 14:00
S996	0	S995 and (haptic$ with (instruct$4 feedback$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 14:01
S997	2	S994 and (haptic$ with (instruct$4 feedback$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 14:02
S998	10	S994 and (((software phone smartphone smart-phone) near3 (app application)) with (control$4 routine protocol instruction))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 14:05
S999	23	S994 and (motor adj mount)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 14:06
S1000	65	S994 and (motor adj mount$3)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 14:09
S1001	0	S994 and ((frame handle) with shape with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 14:15
S1002	28	S994 and ((target$3 desired) near3 (force pressure))	US-PGPUB; USPAT	OR	ON	2020/07/09 14:16

			; USOCR			
S1003	21	S994 and (((routine protocol instruction) with (duration time intensity force pressure direction path frequency amplitude)) same (vibrat$ percussion percussive))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 14:33
S1004	9	S994 and ((((meter sensor monitor$ sensing) near3 (force pressure)) with (feedback control$4)) same (vibrat$ percussion percussive))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 14:34
S1005	1,678	A61H39/00,002,007,04.cpc.	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 14:36
S1006	4	S1005 and (brushless near3 motor)	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 14:37
S1007	17	S1005 and (haptic$ with (instruct$4 feedback$))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 14:37
S1008	27	S1005 and (((software phone smartphone smart-phone) near3 (app application)) with (control$4 routine protocol instruction))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 14:42
S1009	14	S1005 and (motor adj mount$3)	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 14:47
S1010	2	S1005 and ((frame handle) with shape with (triangl$))	US-PGPUB ; USPAT	OR	ON	2020/07/09 14:50

			; USOCR			
S1011	76	S1005 and ((target$3 desired) near3 (force pressure))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 14:50
S1012	18	S1005 and (((routine protocol instruction) with (duration time intensity force pressure direction path frequency amplitude)) same (vibrat$ percussion percussive))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 14:52
S1013	17	S1005 and ((((meter sensor monitor$ sensing) near3 (force pressure)) with (feedback control$4)) same (vibrat$ percussion percussive))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 14:55
S1014	4,819	A61H2201/0165,12,1207,1215,1223,123,1238,14,1409,1418,1481,149,1664.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 14:58
S1015	271	S1014 and (brushless near3 motor)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 14:58
S1016	135	S1014 and (haptic$ with (instruct$4 feedback$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 15:02
S1017	141	S1014 and (((software phone smartphone smart-phone) near3 (app application)) with (control$4 routine protocol instruction))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 15:04
S1018	324	S1014 and (motor adj mount$3)	US-PGPUB; USPAT	OR	ON	2020/07/09 15:09

			; USOCR			
S1019	3	S1014 and ((motor adj mount$3) with flange)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 15:11
S1020	7	S1014 and ((frame handle) with shape with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 15:14
S1021	216	S1014 and ((target$3 desired) near3 (force pressure))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 15:18
S1022	55	S1014 and (((routine protocol instruction) with (duration time intensity force pressure direction path frequency amplitude)) same (vibrat$ percussion percussive))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 15:20
S1023	50	S1014 and ((((meter sensor monitor$ sensing) near3 (force pressure)) with (feedback control$4)) same (vibrat$ percussion percussive))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 15:23
S1024	807	B23D51/16.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 15:25
S1025	25	S1024 and (brushless near3 motor)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 16:00
S1026	0	S1024 and (haptic$ with (instruct$4 feedback$))	US-PGPUB; USPAT	OR	ON	2020/07/09 16:01

			; USOCR			
S1027	0	S1024 and (((software phone smartphone smart-phone) near3 (app application)) with (control$4 routine protocol instruction))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 16:02
S1028	3	S1024 and ((motor adj mount$3) with flange)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 16:02
S1029	45	S1024 and (motor adj mount$3)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 16:03
S1030	0	S1024 and ((frame handle) with shape with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 16:06
S1031	0	S1024 and ((target$3 desired) near3 (force pressure))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 16:06
S1032	0	S1024 and (((routine protocol instruction) with (duration time intensity force pressure direction path frequency amplitude)) same (vibrat$ percussion percussive))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 16:07
S1033	0	S1024 and ((((meter sensor monitor$ sensing) near3 (force pressure)) with (feedback control$4)) same (vibrat$ percussion percussive))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 16:07
S1034	2,010	B23D49/162,165,00,007,008,10,16,167.cpc.	US-PGPUB; USPAT	OR	ON	2020/07/09 16:09

			; USOCR			
S1035	17	S1034 and (brushless near3 motor)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 16:10
S1036	0	S1034 and (haptic$ with (instruct$4 feedback$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 16:12
S1037	0	S1034 and (((software phone smartphone smart-phone) near3 (app application)) with (control$4 routine protocol instruction))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 16:12
S1038	7	S1034 and ((motor adj mount$3) with flange)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 16:21
S1039	90	S1034 and (motor adj mount$3)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 16:22
S1040	0	S1034 and ((frame handle) with shape with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 16:30
S1041	0	S1034 and ((target$3 desired) near3 (force pressure))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 16:32
S1042	0	S1034 and (((routine protocol instruction) with (duration time intensity force pressure direction path frequency amplitude)) same (vibrat$ percussion percussive))	US-PGPUB; USPAT	OR	ON	2020/07/09 16:32

			; USOCR			
S1043	0	S1034 and ((((meter sensor monitor$ sensing) near3 (force pressure)) with (feedback control$4)) same (vibrat$ percussion percussive))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 16:35
S1044	1,939	B26D7/2621,2614.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 16:36
S1045	1	S1044 and (brushless near3 motor)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 16:37
S1046	0	S1044 and (haptic$ with (instruct$4 feedback$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 16:38
S1047	0	S1044 and (((software phone smartphone smart-phone) near3 (app application)) with (control$4 routine protocol instruction))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 16:53
S1048	4	S1044 and ((motor adj mount$3) with flange)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 16:53
S1049	37	S1044 and (motor adj mount$3)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 16:55
S1050	1	S1044 and ((frame handle) with shape with (triangl$))	US-PGPUB; USPAT	OR	ON	2020/07/09 16:57

			; USOCR			
S1051	0	S1044 and ((target$3 desired) near3 (force pressure))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 16:58
S1052	0	S1044 and (((routine protocol instruction) with (duration time intensity force pressure direction path frequency amplitude)) same (vibrat$ percussion percussive))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 16:58
S1053	0	S1044 and ((((meter sensor monitor$ sensing) near3 (force pressure)) with (feedback control$4)) same (vibrat$ percussion percussive))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 16:59
S1054	310	B26D5/14.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 16:59
S1055	12	S1054 and (brushless near3 motor)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 16:59
S1056	0	S1054 and (haptic$ with (instruct$4 feedback$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:00
S1057	0	S1054 and (((software phone smartphone smart-phone) near3 (app application)) with (control$4 routine protocol instruction))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:00
S1058	0	S1054 and ((motor adj mount$3) with flange)	US-PGPUB; USPAT	OR	ON	2020/07/09 17:01

			; USOCR			
S1059	14	S1054 and (motor adj mount$3)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:02
S1060	0	S1054 and ((frame handle) with shape with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:02
S1061	0	S1054 and ((target$3 desired) near3 (force pressure))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:03
S1062	0	S1054 and (((routine protocol instruction) with (duration time intensity force pressure direction path frequency amplitude)) same (vibrat$ percussion percussive))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:04
S1063	0	S1054 and ((((meter sensor monitor$ sensing) near3 (force pressure)) with (feedback control$4)) same (vibrat$ percussion percussive))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:04
S1064	954	A61B17/148,142,14,144.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:05
S1065	56	S1064 and (brushless near3 motor)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:05
S1066	37	S1064 and (haptic$ with (instruct$4 feedback$))	US-PGPUB; USPAT	OR	ON	2020/07/09 17:06

			; USOCR			
S1067	5	S1064 and (((software phone smartphone smart-phone) near3 (app application)) with (control$4 routine protocol instruction))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 17:07
S1068	0	S1064 and ((motor adj mount$3) with flange)	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 17:08
S1069	12	S1064 and (motor adj mount$3)	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 17:08
S1070	0	S1064 and ((frame handle) with shape with (triangl$))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 17:09
S1071	7	S1064 and ((target$3 desired) near3 (force pressure))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 17:09
S1072	2	S1064 and (((routine protocol instruction) with (duration time intensity force pressure direction path frequency amplitude)) same (vibrat$ percussion percussive))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 17:09
S1073	4	S1064 and ((((meter sensor monitor$ sensing) near3 (force pressure)) with (feedback control$4)) same (vibrat$ percussion percussive))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 17:10
S1074	448	B27B19/00,002,006,09,02.cpc.	US-PGPUB ; USPAT	OR	ON	2020/07/09 17:11

			; USOCR			
S1075	19	S1074 and (brushless near3 motor)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:11
S1076	0	S1074 and (haptic$ with (instruct$4 feedback$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:12
S1077	0	S1074 and (((software phone smartphone smart-phone) near3 (app application)) with (control$4 routine protocol instruction))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:13
S1078	0	S1074 and ((motor adj mount$3) with flange)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:13
S1079	25	S1074 and (motor adj mount$3)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:13
S1080	0	S1074 and ((frame handle) with shape with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:15
S1081	0	S1074 and ((target$3 desired) near3 (force pressure))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:15
S1082	0	S1074 and (((routine protocol instruction) with (duration time intensity force pressure direction path frequency amplitude)) same (vibrat$ percussion percussive))	US-PGPUB; USPAT	OR	ON	2020/07/09 17:16

			; USOCR			
S1083	0	S1074 and ((((meter sensor monitor$ sensing) near3 (force pressure)) with (feedback control$4)) same (vibrat$ percussion percussive))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:16
S1084	0	B27B11/06.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:17
S1085	0	B27B11/06.cpc.	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:18
S1086	1,502	83/615,623,632,626,427.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:18
S1087	1	S1086 and (brushless near3 motor)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:18
S1088	0	S1086 and (haptic$ with (instruct$4 feedback$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:19
S1089	0	S1086 and (((software phone smartphone smart-phone) near3 (app application)) with (control$4 routine protocol instruction))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:19
S1090	0	S1086 and ((motor adj mount$3) with flange)	US-PGPUB; USPAT	OR	ON	2020/07/09 17:20

			; USOCR			
S1091	18	S1086 and (motor adj mount$3)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:20
S1092	0	S1086 and ((frame handle) with shape with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:21
S1093	0	S1086 and ((target$3 desired) near3 (force pressure))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:21
S1094	0	S1086 and (((routine protocol instruction) with (duration time intensity force pressure direction path frequency amplitude)) same (vibrat$ percussion percussive))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:21
S1095	0	S1086 and ((((meter sensor monitor$ sensing) near3 (force pressure)) with (feedback control$4)) same (vibrat$ percussion percussive))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:22
S1096	3,005	30/392,393,394,182,208,241,217,218,219,220,242.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:22
S1097	2	S1096 and (brushless near3 motor)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:23
S1098	0	S1096 and (haptic$ with (instruct$4 feedback$))	US-PGPUB; USPAT	OR	ON	2020/07/09 17:23

			; USOCR			
S1099	0	S1096 and (((software phone smartphone smart-phone) near3 (app application)) with (control$4 routine protocol instruction))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 17:24
S1100	1	S1096 and ((motor adj mount$3) with flange)	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 17:28
S1101	115	S1096 and (motor adj mount$3)	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 17:29
S1102	0	S1097 and ((frame handle) with shape with (triangl$))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 17:38
S1103	0	S1096 and ((frame handle) with shape with (triangl$))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 17:38
S1104	0	S1096 and ((target$3 desired) near3 (force pressure))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 17:39
S1105	0	S1096 and (((routine protocol instruction) with (duration time intensity force pressure direction path frequency amplitude)) same (vibrat$ percussion percussive))	US-PGPUB ; USPAT ; USOCR	OR	ON	2020/07/09 17:39
S1106	0	S1096 and ((((meter sensor monitor$ sensing) near3 (force pressure)) with (feedback control$4)) same (vibrat$ percussion percussive))	US-PGPUB ; USPAT	OR	ON	2020/07/09 17:40

			; USOCR			
S1107	1,686	173/49,114,122,205.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:40
S1108	7	S1107 and (brushless near3 motor)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:41
S1109	0	S1107 and (haptic$ with (instruct$4 feedback$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:42
S1110	0	S1107 and (((software phone smartphone smart-phone) near3 (app application)) with (control$4 routine protocol instruction))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:42
S1111	1	S1107 and ((motor adj mount$3) with flange)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:42
S1112	79	S1107 and (motor adj mount$3)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:43
S1113	0	S1107 and ((frame handle) with shape with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:47
S1114	3	S1107 and ((target$3 desired) near3 (force pressure))	US-PGPUB; USPAT	OR	ON	2020/07/09 17:47

			; USOCR			
S1115	0	S1107 and (((routine protocol instruction) with (duration time intensity force pressure direction path frequency amplitude)) same (vibrat$ percussion percussive))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:51
S1116	5	S1107 and ((((meter sensor monitor$ sensing) near3 (force pressure)) with (feedback control$4)) same (vibrat$ percussion percussive))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:52
S1117	771	227/131.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:53
S1118	11	S1117 and (brushless near3 motor)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:53
S1119	0	S1117 and (haptic$ with (instruct$4 feedback$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:54
S1120	0	S1117 and (((software phone smartphone smart-phone) near3 (app application)) with (control$4 routine protocol instruction))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:54
S1121	18	S1117 and ((motor adj mount$3) with flange)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:54
S1122	6	S1117 and ((frame handle) with shape with (triangl$))	US-PGPUB; USPAT	OR	ON	2020/07/09 17:55

			; USOCR			
S1123	4	S1117 and ((target$3 desired) near3 (force pressure))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:56
S1124	0	S1117 and (((routine protocol instruction) with (duration time intensity force pressure direction path frequency amplitude)) same (vibrat$ percussion percussive))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:57
S1125	0	S1117 and ((((meter sensor monitor$ sensing) near3 (force pressure)) with (feedback control$4)) same (vibrat$ percussion percussive))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 17:59
S1126	0	D08/8,61,64.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:00
S1127	2,005	D8/8,61,64.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:01
S1128	3	S1127 and (brushless near3 motor)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:01
S1129	0	S1127 and (haptic$ with (instruct$4 feedback$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:01
S1130	0	S1127 and (((software phone smartphone smart-phone) near3 (app application)) with (control$4 routine protocol instruction))	US-PGPUB; USPAT	OR	ON	2020/07/09 18:01

			; USOCR			
S1131	1	S1127 and ((motor adj mount$3) with flange)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:02
S1132	15	S1127 and (motor adj mount$3)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:02
S1133	0	S1127 and ((frame handle) with shape with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:03
S1134	0	S1127 and ((target$3 desired) near3 (force pressure))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:03
S1135	0	S1127 and (((routine protocol instruction) with (duration time intensity force pressure direction path frequency amplitude)) same (vibrat$ percussion percussive))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:03
S1136	0	S1127 and ((((meter sensor monitor$ sensing) near3 (force pressure)) with (feedback control$4)) same (vibrat$ percussion percussive))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:04
S1137	400	144/121,122,147.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:05
S1138	0	S1137 and (brushless near3 motor)	US-PGPUB; USPAT	OR	ON	2020/07/09 18:05

			; USOCR			
S1139	0	S1137 and (haptic$ with (instruct$4 feedback$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:05
S1140	0	S1137 and (((software phone smartphone smart-phone) near3 (app application)) with (control$4 routine protocol instruction))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:05
S1141	0	S1137 and ((motor adj mount$3) with flange)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:05
S1142	3	S1137 and (motor adj mount$3)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:05
S1143	0	S1137 and ((frame handle) with shape with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:05
S1144	0	S1137 and ((target$3 desired) near3 (force pressure))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:06
S1145	0	S1137 and (((routine protocol instruction) with (duration time intensity force pressure direction path frequency amplitude)) same (vibrat$ percussion percussive))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:06
S1146	0	S1137 and ((((meter sensor monitor$ sensing) near3 (force pressure)) with (feedback control$4)) same (vibrat$ percussion percussive))	US-PGPUB; USPAT	OR	ON	2020/07/09 18:06

			; USOCR			
S1147	588	125/16.01.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:15
S1148	0	S1147 and (brushless near3 motor)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:15
S1149	0	S1147 and (haptic$ with (instruct$4 feedback$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:15
S1150	0	S1147 and (((software phone smartphone smart-phone) near3 (app application)) with (control$4 routine protocol instruction))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:15
S1151	0	S1147 and ((motor adj mount$3) with flange)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:15
S1152	9	S1147 and (motor adj mount$3)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:16
S1153	0	S1147 and ((frame handle) with shape with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:16
S1154	0	S1147 and ((target$3 desired) near3 (force pressure))	US-PGPUB; USPAT	OR	ON	2020/07/09 18:16

			; USOCR			
S1155	0	S1147 and (((routine protocol instruction) with (duration time intensity force pressure direction path frequency amplitude)) same (vibrat$ percussion percussive))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:17
S1156	0	S1147 and ((((meter sensor monitor$ sensing) near3 (force pressure)) with (feedback control$4)) same (vibrat$ percussion percussive))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:22
S1157	867	76/31,36.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:23
S1158	0	S1157 and (brushless near3 motor)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:23
S1159	0	S1157 and (haptic$ with (instruct$4 feedback$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:23
S1160	0	S1157 and (((software phone smartphone smart-phone) near3 (app application)) with (control$4 routine protocol instruction))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:23
S1161	0	S1157 and ((motor adj mount$3) with flange)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:24
S1162	1	S1157 and (motor adj mount$3)	US-PGPUB; USPAT	OR	ON	2020/07/09 18:24

			; USOCR			
S1163	0	S1157 and ((frame handle) with shape with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:24
S1164	0	S1157 and ((target$3 desired) near3 (force pressure))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:24
S1165	0	S1157 and (((routine protocol instruction) with (duration time intensity force pressure direction path frequency amplitude)) same (vibrat$ percussion percussive))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:25
S1166	0	S1157 and ((((meter sensor monitor$ sensing) near3 (force pressure)) with (feedback control$4)) same (vibrat$ percussion percussive))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:25
S1167	478	601/97,107.ccls.	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:25
S1168	2	S1167 and (brushless near3 motor)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:25
S1169	0	S1167 and (haptic$ with (instruct$4 feedback$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:26
S1170	0	S1167 and (((software phone smartphone smart-phone) near3 (app application)) with (control$4 routine protocol instruction))	US-PGPUB; USPAT	OR	ON	2020/07/09 18:26

			; USOCR			
S1171	0	S1167 and ((motor adj mount$3) with flange)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:26
S1172	15	S1167 and (motor adj mount$3)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:26
S1173	0	S1167 and ((frame handle) with shape with (triangl$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:27
S1174	13	S1167 and ((target$3 desired) near3 (force pressure))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:30
S1175	4	S1167 and (((routine protocol instruction) with (duration time intensity force pressure direction path frequency amplitude)) same (vibrat$ percussion percussive))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:33
S1176	3	S1167 and ((((meter sensor monitor$ sensing) near3 (force pressure)) with (feedback control$4)) same (vibrat$ percussion percussive))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:35
S1177	377	(US-20140180331-$ or US-20130261516-$ or US-20130138023-$ or US-20120253245-$ or US-20080103419-$ or US-20070150004-$ or US-20060192527-$ or US-20060123941-$ or US-20060025710-$ or US-20030195443-$ or US-20030009116-$ or US-20010016697-$ or US-20160206502-$ or US-20160367425-$ or US-20170027798-$ or US-20030094356-$ or US-20170304145-$ or US-20140163442-$ or US-20130281897-$ or US-20120101517-$ or US-20100137907-$ or US-20100010399-$ or US-20090270915-$ or US-20090222024-$ or US-	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2020/07/09 18:57

20020107459-$ or US-20170304144-$).did. or (US-
20170156974-$ or US-20160346152-$ or US-
20160271009-$ or US-20170156975-$ or US-
20030149381-$ or US-20150202114-$ or US-
20130012849-$ or US-20020072693-$ or US-
20130123677-$ or US-20130072837-$ or US-
20100331745-$ or US-20010027280-$ or US-
20030028134-$ or US-20030065280-$ or US-
20020183668-$ or US-20020082536-$ or US-
20140323931-$ or US-20110137217-$ or US-
20110041864-$ or US-20050113636-$ or US-
20090038069-$ or US-20040064074-$ or US-
20090086569-$ or US-20120253246-$ or US-
20170281457-$ or US-20170105896-$ or US-
20070299378-$).did. or (US-20100125228-$ or US-
20060074362-$ or US-20170281459-$ or US-
20040176710-$ or US-20150148592-$ or US-
20080262397-$ or US-20100145242-$ or US-
20030144615-$ or US-20090177128-$ or US-
20170241201-$ or US-20150198219-$ or US-
20090165387-$ or US-20070175647-$ or US-
20050217900-$ or US-20050015030-$ or US-
20100024571-$ or US-20150305973-$ or US-
20160015596-$ or US-20150182411-$ or US-
20160131228-$ or US-20090032275-$ or US-
20030019799-$ or US-20130245511-$ or US-
20040039314-$ or US-20070144310-$ or US-
20180263845-$ or US-20150005682-$).did. or (US-
20180200141-$ or US-20040255475-$ or US-
20040255474-$ or US-20040187324-$ or US-
20040117993-$ or US-20150367494-$ or US-
20150033564-$ or US-20130133210-$ or US-
20090100690-$ or US-20060260141-$ or US-
20050178012-$ or US-20080047150-$ or US-
20120192440-$ or US-20120030955-$ or US-
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20180099339-$ or US-20110265335-$ or US-
20110131820-$ or US-20060288594-$ or US-
20080016705-$ or US-20070209217-$ or US-
20190017528-$ or US-20190015294-$ or US-
20130019483-$ or US-20150375315-$ or US-
20110185582-$).did. or (US-20190224765-$ or US-
20180236572-$ or US-20190209424-$ or US-
20180370012-$ or US-20190254921-$ or US-
20060047315-$ or US-20050131461-$ or US-
20020082532-$ or US-20180031089-$ or US-
20190175434-$ or US-20080004554-$ or US-
20050159689-$ or US-20170079865-$ or US-
20190083352-$ or US-20140283394-$ or US-
20170361386-$ or US-20170173711-$ or US-
20140182871-$ or US-20090188119-$ or US-
20080189961-$ or US-20050126018-$ or US-
20010011420-$ or US-20020138991-$ or US-

20190351539-$ or US-20160199924-$ or US-20100162579-$ or US-20130014968-$).did. or (US-20080229591-$ or US-20050257385-$ or US-20050257384-$ or US-20110107608-$ or US-20140360335-$ or US-20130204255-$ or US-20090326540-$ or US-20050252011-$ or US-20150113815-$ or US-20140007436-$ or US-20070289149-$ or US-20050262710-$ or US-20200069510-$ or US-20190365598-$ or US-20200046602-$ or US-20200093682-$ or US-20180256432-$ or US-20200060918-$ or US-20200000678-$ or US-20130110017-$ or US-20150297437-$ or US-20110224580-$ or US-20190307631-$ or US-20120215141-$ or US-20120215280-$ or US-20150133832-$ or US-20150005672-$).did. or (US-20160278584-$ or US-20130237751-$ or US-20050207609-$ or US-20150335520-$ or US-20150169124-$ or US-20160213558-$ or US-20150119771-$ or US-20190290076-$ or US-20170095398-$ or US-20160151238-$ or US-20160000642-$ or US-20050054958-$ or US-20150290076-$ or US-20160158097-$ or US-20190099327-$ or US-20200214934-$ or US-20070179414-$ or US-20200038530-$ or US-20180288160-$ or US-20180279843-$ or US-20170049278-$ or US-20180243158-$ or US-20160303668-$ or US-20180326568-$ or US-20140360029-$ or US-20140194790-$).did. or (US-6663657-$ or US-6228042-$ or US-5951501-$ or US-5569168-$ or US-4549535-$ or US-4173217-$ or US-5273479-$ or US-8715161-$ or US-7927259-$ or US-7041072-$ or US-6733414-$ or US-6723060-$ or US-6682496-$ or US-6599260-$ or US-6352518-$ or US-6027444-$ or US-5716332-$ or US-4827914-$ or US-4790296-$ or US-4513737-$ or US-3837335-$ or US-3626934-$ or US-9827159-$ or US-4716890-$ or US-5140979-$ or US-3754548-$).did. or (US-6786878-$ or US-7238162-$ or US-7128722-$ or US-8951216-$ or US-5460597-$ or US-5417644-$ or US-6730050-$ or US-6432072-$ or US-5695451-$ or US-5475883-$ or US-5085207-$ or US-4162675-$ or US-4088128-$ or US-4079733-$ or US-3724451-$ or US-8342187-$ or US-7590445-$ or US-4730605-$ or US-7951098-$ or US-4025809-$ or US-3580246-$ or US-6228103-$ or US-9161881-$ or US-4566442-$ or US-5983416-$ or US-4722327-$ or US-7367981-$).did. or (US-5676637-$ or US-8777881-$ or US-4834075-$ or US-6500135-$ or US-3806980-$ or US-7503923-$ or US-5300095-$ or US-4841955-$ or US-6730051-$ or US-5843006-$ or US-3747594-$ or US-5214975-$ or US-5203113-$ or US-5640735-$ or US-5374237-$ or US-7996996-$ or US-9724771-$ or US-9606026-$ or US-7059425-$ or US-5655887-$ or US-3854563-$ or US-

		5573500-$ or US-3736920-$ or US-5088474-$ or US-9265689-$ or US-5803916-$ or US-6805700-$).did. or (US-6602211-$ or US-6997889-$ or US-4158246-$ or US-9289348-$ or US-5470303-$ or US-5159922-$ or US-9889066-$ or US-10027201-$ or US-8640347-$ or US-5212887-$ or US-5099705-$ or US-5079844-$ or US-3759020-$ or US-7036401-$ or US-3863342-$ or US-7818887-$ or US-RE36269-$ or US-5083376-$ or US-7448137-$ or US-6671969-$ or US-7096589-$ or US-5940977-$ or US-7127973-$ or US-8813377-$ or US-4976164-$ or US-8656598-$ or US-5170564-$).did. or (US-3971132-$ or US-6772662-$ or US-4272996-$ or US-3942251-$ or US-6212781-$ or US-7191847-$ or US-9192390-$ or US-5832611-$ or US-6264211-$ or US-7251896-$ or US-7370423-$ or US-4150668-$ or US-4817738-$ or US-6557816-$ or US-4563605-$ or US-5129118-$ or US-4420995-$ or US-9333628-$ or US-8475076-$ or US-7954402-$ or US-6971285-$ or US-6964216-$ or US-5660491-$ or US-2964037-$ or US-1882040-$ or US-8322456-$ or US-6938706-$).did. or (US-8561717-$ or US-10357425-$ or US-10428850-$ or US-10470970-$ or US-4283855-$ or US-10525541-$ or US-3876015-$ or US-3834019-$ or US-3805383-$ or US-6357124-$ or US-4240204-$ or US-7509744-$ or US-5007172-$ or US-3706474-$ or US-4991298-$ or US-8960323-$ or US-8578615-$ or US-6282797-$ or US-6634107-$ or US-6662455-$ or US-6758119-$ or US-3785053-$ or US-9221112-$ or US-7109613-$ or US-5624000-$ or US-10314762-$ or US-9543871-$).did. or (US-10702448-$ or US-10517790-$ or US-10420700-$ or US-6648840-$ or US-4697580-$ or US-6568089-$ or US-8702633-$).did. or (US-2964037-$ or US-1882040-$ or US-2902067-$ or US-2868248-$ or US-2822005-$ or US-2808082-$ or US-2240755-$ or US-3309932-$ or US-3545301-$ or US-3172675-$ or US-2839101-$ or US-3050093-$ or US-3340612-$ or US-3623223-$).did. or (EP-1313116-$ or WO-2009014727-$).did. or (JP-07051393-$ or JP-02019157-$ or JP-2005204777-$).did. or (WO-2015038005-$ or WO-2014118596-$ or JP-2010534110-$).did.				
S1178	39	S1177 and ((controller processor control controlling microprocessor micro-processor CPU) same (protocol routine instruction))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:58
S1179	69	S1177 and ((controller processor control controlling microprocessor micro-processor CPU) same (protocol routine instruction mode))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 18:58

S1180	61	S1179 and (vibrat$ percussion percussive massag$)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 19:01
S1181	52	S1177 and ((controller processor control controlling microprocessor micro-processor CPU) same (protocol routine instruction mode) same (speed frequency duration time amplitude force pressure))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/09 19:03
S1182	377	(US-20140180331-$ or US-20130261516-$ or US-20130138023-$ or US-20120253245-$ or US-20080103419-$ or US-20070150004-$ or US-20060192527-$ or US-20060123941-$ or US-20060025710-$ or US-20030195443-$ or US-20030009116-$ or US-20010016697-$ or US-20160206502-$ or US-20160367425-$ or US-20170027798-$ or US-20030094356-$ or US-20170304145-$ or US-20140163442-$ or US-20130281897-$ or US-20120101517-$ or US-20100137907-$ or US-20100010399-$ or US-20090270915-$ or US-20090222024-$ or US-20020107459-$ or US-20170304144-$).did. or (US-20170156974-$ or US-20160346152-$ or US-20160271009-$ or US-20170156975-$ or US-20030149381-$ or US-20150202114-$ or US-20130012849-$ or US-20020072693-$ or US-20130123677-$ or US-20130072837-$ or US-20100331745-$ or US-20010027280-$ or US-20030028134-$ or US-20030065280-$ or US-20020183668-$ or US-20020082536-$ or US-20140323931-$ or US-20110137217-$ or US-20110041864-$ or US-20050113636-$ or US-20090038069-$ or US-20040064074-$ or US-20090086569-$ or US-20120253246-$ or US-20170281457-$ or US-20170105896-$ or US-20070299378-$).did. or (US-20100125228-$ or US-20060074362-$ or US-20170281459-$ or US-20040176710-$ or US-20150148592-$ or US-20080262397-$ or US-20100145242-$ or US-20030144615-$ or US-20090177128-$ or US-20170241201-$ or US-20150198219-$ or US-20090165387-$ or US-20070175647-$ or US-20050217900-$ or US-20050015030-$ or US-20100024571-$ or US-20150305973-$ or US-20160015596-$ or US-20150182411-$ or US-20160131228-$ or US-20090032275-$ or US-20030019799-$ or US-20130245511-$ or US-20040039314-$ or US-20070144310-$ or US-20180263845-$ or US-20150005682-$).did. or (US-	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2020/07/10 15:27

20180200141-$ or US-20040255475-$ or US-
20040255474-$ or US-20040187324-$ or US-
20040117993-$ or US-20150367494-$ or US-
20150033564-$ or US-20130133210-$ or US-
20090100690-$ or US-20060260141-$ or US-
20050178012-$ or US-20080047150-$ or US-
20120192440-$ or US-20120030955-$ or US-
20030070307-$ or US-20090272617-$ or US-
20180099339-$ or US-20110265335-$ or US-
20110131820-$ or US-20060288594-$ or US-
20080016705-$ or US-20070209217-$ or US-
20190017528-$ or US-20190015294-$ or US-
20130019483-$ or US-20150375315-$ or US-
20110185582-$).did. or (US-20190224765-$ or US-
20180236572-$ or US-20190209424-$ or US-
20180370012-$ or US-20190254921-$ or US-
20060047315-$ or US-20050131461-$ or US-
20020082532-$ or US-20180031089-$ or US-
20190175434-$ or US-20080004554-$ or US-
20050159689-$ or US-20170079865-$ or US-
20190083352-$ or US-20140283394-$ or US-
20170361386-$ or US-20170173711-$ or US-
20140182871-$ or US-20090188119-$ or US-
20080189961-$ or US-20050126018-$ or US-
20010011420-$ or US-20020138991-$ or US-
20190351539-$ or US-20160199924-$ or US-
20100162579-$ or US-20130014968-$).did. or (US-
20080229591-$ or US-20050257385-$ or US-
20050257384-$ or US-20110107608-$ or US-
20140360335-$ or US-20130204255-$ or US-
20090326540-$ or US-20050252011-$ or US-
20150113815-$ or US-20140007436-$ or US-
20070289149-$ or US-20050262710-$ or US-
20200069510-$ or US-20190365598-$ or US-
20200046602-$ or US-20200093682-$ or US-
20180256432-$ or US-20200060918-$ or US-
20200000678-$ or US-20130110017-$ or US-
20150297437-$ or US-20110224580-$ or US-
20190307631-$ or US-20120215141-$ or US-
20120215280-$ or US-20150133832-$ or US-
20150005672-$).did. or (US-20160278584-$ or US-
20130237751-$ or US-20050207609-$ or US-
20150335520-$ or US-20150169124-$ or US-
20160213558-$ or US-20150119771-$ or US-
20190290076-$ or US-20170095398-$ or US-
20160151238-$ or US-20160000642-$ or US-
20050054958-$ or US-20150290076-$ or US-
20160158097-$ or US-20190099327-$ or US-
20200214934-$ or US-20070179414-$ or US-
20200038530-$ or US-20180288160-$ or US-
20180279843-$ or US-20170049278-$ or US-
20180243158-$ or US-20160303668-$ or US-
20180326568-$ or US-20140360029-$ or US-

20140194790-$).did. or (US-6663657-$ or US-6228042-$ or US-5951501-$ or US-5569168-$ or US-4549535-$ or US-4173217-$ or US-5273479-$ or US-8715161-$ or US-7927259-$ or US-7041072-$ or US-6733414-$ or US-6723060-$ or US-6682496-$ or US-6599260-$ or US-6352518-$ or US-6027444-$ or US-5716332-$ or US-4827914-$ or US-4790296-$ or US-4513737-$ or US-3837335-$ or US-3626934-$ or US-9827159-$ or US-4716890-$ or US-5140979-$ or US-3754548-$).did. or (US-6786878-$ or US-7238162-$ or US-7128722-$ or US-8951216-$ or US-5460597-$ or US-5417644-$ or US-6730050-$ or US-6432072-$ or US-5695451-$ or US-5475883-$ or US-5085207-$ or US-4162675-$ or US-4088128-$ or US-4079733-$ or US-3724451-$ or US-8342187-$ or US-7590445-$ or US-4730605-$ or US-7951098-$ or US-4025809-$ or US-3580246-$ or US-6228103-$ or US-9161881-$ or US-4566442-$ or US-5983416-$ or US-4722327-$ or US-7367981-$).did. or (US-5676637-$ or US-8777881-$ or US-4834075-$ or US-6500135-$ or US-3806980-$ or US-7503923-$ or US-5300095-$ or US-4841955-$ or US-6730051-$ or US-5843006-$ or US-3747594-$ or US-5214975-$ or US-5203113-$ or US-5640735-$ or US-5374237-$ or US-7996996-$ or US-9724771-$ or US-9606026-$ or US-7059425-$ or US-5655887-$ or US-3854563-$ or US-5573500-$ or US-3736920-$ or US-5088474-$ or US-9265689-$ or US-5803916-$ or US-6805700-$).did. or (US-6602211-$ or US-6997889-$ or US-4158246-$ or US-9289348-$ or US-5470303-$ or US-5159922-$ or US-9889066-$ or US-10027201-$ or US-8640347-$ or US-5212887-$ or US-5099705-$ or US-5079844-$ or US-3759020-$ or US-7036401-$ or US-3863342-$ or US-7818887-$ or US-RE36269-$ or US-5083376-$ or US-7448137-$ or US-6671969-$ or US-7096589-$ or US-5940977-$ or US-7127973-$ or US-8813377-$ or US-4976164-$ or US-8656598-$ or US-5170564-$).did. or (US-3971132-$ or US-6772662-$ or US-4272996-$ or US-3942251-$ or US-6212781-$ or US-7191847-$ or US-9192390-$ or US-5832611-$ or US-6264211-$ or US-7251896-$ or US-7370423-$ or US-4150668-$ or US-4817738-$ or US-6557816-$ or US-4563605-$ or US-5129118-$ or US-4420995-$ or US-9333628-$ or US-8475076-$ or US-7954402-$ or US-6971285-$ or US-6964216-$ or US-5660491-$ or US-2964037-$ or US-1882040-$ or US-8322456-$ or US-6938706-$).did. or (US-8561717-$ or US-10357425-$ or US-10428850-$ or US-10470970-$ or US-4283855-$ or US-10525541-$ or US-3876015-$ or US-3834019-$ or US-3805383-$ or US-6357124-$ or US-4240204-$ or US-7509744-$ or US-5007172-$ or US-3706474-$ or US-4991298-$ or US-8960323-$ or US-8578615-$ or US-6282797-$ or US-6634107-$ or US-6662455-$ or US-6758119-$ or US-3785053-$ or US-9221112-$ or US-7109613-$ or US-

		5624000-$ or US-10314762-$ or US-9543871-$).did. or (US-10702448-$ or US-10517790-$ or US-10420700-$ or US-6648840-$ or US-4697580-$ or US-6568089-$ or US-8702633-$).did. or (US-2964037-$ or US-1882040-$ or US-2902067-$ or US-2868248-$ or US-2822005-$ or US-2808082-$ or US-2240755-$ or US-3309932-$ or US-3545301-$ or US-3172675-$ or US-2839101-$ or US-3050093-$ or US-3340612-$ or US-3623223-$).did. or (EP-1313116-$ or WO-2009014727-$).did. or (JP-07051393-$ or JP-02019157-$ or JP-2005204777-$).did. or (WO-2015038005-$ or WO-2014118596-$ or JP-2010534110-$).did.				
S1183	16	S1182 and (touchscreen touch-screen (touch adj screen))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/10 15:27
S1184	55	S1182 and (instruct$5 prompt$)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/10 15:38
S1185	10	S1182 and (display$ with force)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/10 15:50
S1186	3	S1182 and (tutorial)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/10 16:00
S1187	595	(a61h.cpcl. or "601".clas.) and (massag$ same (instruct$5 prompt$ tutorial))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/10 16:26
S1188	413	(a61h.cpcl. or "601".clas.) and (massag$ with (instruct$5 prompt$ tutorial))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/10 16:27

S1189	80	(a61h.cpcl. or "601".clas.) and (massag$ with (instruct$5 prompt$ tutorial) with (use operation grip$3 hold$3))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/10 16:28
S1190	196	(a61h.cpcl. or "601".clas.) and (massag$ with (instruct$5 prompt$ tutorial guide step$1by$1step) with (use operation grip$3 hold$3))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/10 16:29
S1191	4	(a61h.cpcl. or "601".clas.) and (massag$ same (step$1by$1step))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/10 17:44
S1192	33	(a61h.cpcl. or "601".clas.) and (guide with (step$1by$1step))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/10 17:46
S1193	57	(a61h.cpcl. or "601".clas.) and ((instruct$4 guide tutorial prompt$) with (step$1by$1step))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/10 17:47
S1194	377	(US-20140180331-$ or US-20130261516-$ or US-20130138023-$ or US-20120253245-$ or US-20080103419-$ or US-20070150004-$ or US-20060192527-$ or US-20060123941-$ or US-20060025710-$ or US-20030195443-$ or US-20030009116-$ or US-20010016697-$ or US-20160206502-$ or US-20160367425-$ or US-20170027798-$ or US-20030094356-$ or US-20170304145-$ or US-20140163442-$ or US-20130281897-$ or US-20120101517-$ or US-20100137907-$ or US-20100010399-$ or US-20090270915-$ or US-20090222024-$ or US-20020107459-$ or US-20170304144-$).did. or (US-20170156974-$ or US-20160346152-$ or US-20160271009-$ or US-20170156975-$ or US-20030149381-$ or US-20150202114-$ or US-20130012849-$ or US-20020072693-$ or US-20130123677-$ or US-20130072837-$ or US-20100331745-$ or US-20010027280-$ or US-20030028134-$ or US-20030065280-$ or US-20020183668-$ or US-	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2020/07/11 11:20

20140323931-$ or US-20110137217-$ or US-20110041864-$ or US-20050113636-$ or US-20090038069-$ or US-20040064074-$ or US-20090086569-$ or US-20120253246-$ or US-20170281457-$ or US-20170105896-$ or US-20070299378-$).did. or (US-20100125228-$ or US-20060074362-$ or US-20170281459-$ or US-20040176710-$ or US-20150148592-$ or US-20080262397-$ or US-20100145242-$ or US-20030144615-$ or US-20090177128-$ or US-20170241201-$ or US-20150198219-$ or US-20090165387-$ or US-20070175647-$ or US-20050217900-$ or US-20050015030-$ or US-20100024571-$ or US-20150305973-$ or US-20160015596-$ or US-20150182411-$ or US-20160131228-$ or US-20090032275-$ or US-20030019799-$ or US-20130245511-$ or US-20040039314-$ or US-20070144310-$ or US-20180263845-$ or US-20150005682-$).did. or (US-20180200141-$ or US-20040255475-$ or US-20040255474-$ or US-20040187324-$ or US-20040117993-$ or US-20150367494-$ or US-20150033564-$ or US-20130133210-$ or US-20090100690-$ or US-20060260141-$ or US-20050178012-$ or US-20080047150-$ or US-20120192440-$ or US-20120030955-$ or US-20030070307-$ or US-20090272617-$ or US-20180099339-$ or US-20110265335-$ or US-20110131820-$ or US-20060288594-$ or US-20080016705-$ or US-20070209217-$ or US-20190017528-$ or US-20190015294-$ or US-20130019483-$ or US-20150375315-$ or US-20110185582-$).did. or (US-20190224765-$ or US-20180236572-$ or US-20190209424-$ or US-20180370012-$ or US-20190254921-$ or US-20060047315-$ or US-20050131461-$ or US-20020082532-$ or US-20180031089-$ or US-20190175434-$ or US-20080004554-$ or US-20050159689-$ or US-20170079865-$ or US-20190083352-$ or US-20140283394-$ or US-20170361386-$ or US-20170173711-$ or US-20140182871-$ or US-20090188119-$ or US-20080189961-$ or US-20050126018-$ or US-20010011420-$ or US-20020138991-$ or US-20190351539-$ or US-20160199924-$ or US-20100162579-$ or US-20130014968-$).did. or (US-20080229591-$ or US-20050257385-$ or US-20050257384-$ or US-20110107608-$ or US-20140360335-$ or US-20130204255-$ or US-20090326540-$ or US-20050252011-$ or US-20150113815-$ or US-20140007436-$ or US-20070289149-$ or US-20050262710-$ or US-20200069510-$ or US-20190365598-$ or US-

20200046602-$ or US-20200093682-$ or US-20180256432-$ or US-20200060918-$ or US-20200000678-$ or US-20130110017-$ or US-20150297437-$ or US-20110224580-$ or US-20190307631-$ or US-20120215141-$ or US-20120215280-$ or US-20150133832-$ or US-20150005672-$).did. or (US-20160278584-$ or US-20130237751-$ or US-20050207609-$ or US-20150335520-$ or US-20150169124-$ or US-20160213558-$ or US-20150119771-$ or US-20190290076-$ or US-20170095398-$ or US-20160151238-$ or US-20160000642-$ or US-20050054958-$ or US-20150290076-$ or US-20160158097-$ or US-20190099327-$ or US-20200214934-$ or US-20070179414-$ or US-20200038530-$ or US-20180288160-$ or US-20180279843-$ or US-20170049278-$ or US-20180243158-$ or US-20160303668-$ or US-20180326568-$ or US-20140360029-$ or US-20140194790-$).did. or (US-6663657-$ or US-6228042-$ or US-5951501-$ or US-5569168-$ or US-4549535-$ or US-4173217-$ or US-5273479-$ or US-8715161-$ or US-7927259-$ or US-7041072-$ or US-6733414-$ or US-6723060-$ or US-6682496-$ or US-6599260-$ or US-6352518-$ or US-6027444-$ or US-5716332-$ or US-4827914-$ or US-4790296-$ or US-4513737-$ or US-3837335-$ or US-3626934-$ or US-9827159-$ or US-4716890-$ or US-5140979-$ or US-3754548-$).did. or (US-6786878-$ or US-7238162-$ or US-7128722-$ or US-8951216-$ or US-5460597-$ or US-5417644-$ or US-6730050-$ or US-6432072-$ or US-5695451-$ or US-5475883-$ or US-5085207-$ or US-4162675-$ or US-4088128-$ or US-4079733-$ or US-3724451-$ or US-8342187-$ or US-7590445-$ or US-4730605-$ or US-7951098-$ or US-4025809-$ or US-3580246-$ or US-6228103-$ or US-9161881-$ or US-4566442-$ or US-5983416-$ or US-4722327-$ or US-7367981-$).did. or (US-5676637-$ or US-8777881-$ or US-4834075-$ or US-6500135-$ or US-3806980-$ or US-7503923-$ or US-5300095-$ or US-4841955-$ or US-6730051-$ or US-5843006-$ or US-3747594-$ or US-5214975-$ or US-5203113-$ or US-5640735-$ or US-5374237-$ or US-7996996-$ or US-9724771-$ or US-9606026-$ or US-7059425-$ or US-5655887-$ or US-3854563-$ or US-5573500-$ or US-3736920-$ or US-5088474-$ or US-9265689-$ or US-5803916-$ or US-6805700-$).did. or (US-6602211-$ or US-6997889-$ or US-4158246-$ or US-9289348-$ or US-5470303-$ or US-5159922-$ or US-9889066-$ or US-10027201-$ or US-8640347-$ or US-5212887-$ or US-5099705-$ or US-5079844-$ or US-3759020-$ or US-7036401-$ or US-3863342-$ or US-7818887-$ or US-RE36269-$ or US-5083376-$ or US-7448137-$ or US-6671969-$ or US-7096589-$ or US-

		5940977-$ or US-7127973-$ or US-8813377-$ or US-4976164-$ or US-8656598-$ or US-5170564-$).did. or (US-3971132-$ or US-6772662-$ or US-4272996-$ or US-3942251-$ or US-6212781-$ or US-7191847-$ or US-9192390-$ or US-5832611-$ or US-6264211-$ or US-7251896-$ or US-7370423-$ or US-4150668-$ or US-4817738-$ or US-6557816-$ or US-4563605-$ or US-5129118-$ or US-4420995-$ or US-9333628-$ or US-8475076-$ or US-7954402-$ or US-6971285-$ or US-6964216-$ or US-5660491-$ or US-2964037-$ or US-1882040-$ or US-8322456-$ or US-6938706-$).did. or (US-8561717-$ or US-10357425-$ or US-10428850-$ or US-10470970-$ or US-4283855-$ or US-10525541-$ or US-3876015-$ or US-3834019-$ or US-3805383-$ or US-6357124-$ or US-4240204-$ or US-7509744-$ or US-5007172-$ or US-3706474-$ or US-4991298-$ or US-8960323-$ or US-8578615-$ or US-6282797-$ or US-6634107-$ or US-6662455-$ or US-6758119-$ or US-3785053-$ or US-9221112-$ or US-7109613-$ or US-5624000-$ or US-10314762-$ or US-9543871-$).did. or (US-10702448-$ or US-10517790-$ or US-10420700-$ or US-6648840-$ or US-4697580-$ or US-6568089-$ or US-8702633-$).did. or (US-2964037-$ or US-1882040-$ or US-2902067-$ or US-2868248-$ or US-2822005-$ or US-2808082-$ or US-2240755-$ or US-3309932-$ or US-3545301-$ or US-3172675-$ or US-2839101-$ or US-3050093-$ or US-3340612-$ or US-3623223-$).did. or (EP-1313116-$ or WO-2009014727-$).did. or (JP-07051393-$ or JP-02019157-$ or JP-2005204777-$).did. or (WO-2015038005-$ or WO-2014118596-$ or JP-2010534110-$).did.				
S1195	12	S1194 and (kit)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/11 11:20
S1196	380	(US-20140180331-$ or US-20130261516-$ or US-20130138023-$ or US-20120253245-$ or US-20080103419-$ or US-20070150004-$ or US-20060192527-$ or US-20060123941-$ or US-20060025710-$ or US-20030195443-$ or US-20030009116-$ or US-20010016697-$ or US-20160206502-$ or US-20160367425-$ or US-20170027798-$ or US-20030094356-$ or US-20170304145-$ or US-20140163442-$ or US-20130281897-$ or US-20120101517-$ or US-20100137907-$ or US-20100010399-$ or US-20090270915-$ or US-20090222024-$ or US-20020107459-$ or US-20170304144-$).did. or (US-20170156974-$ or US-20160346152-$ or US-20160271009-$ or US-20170156975-$ or US-	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2020/07/13 11:25

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20170241201-$ or US-20150198219-$ or US-
20090165387-$ or US-20070175647-$ or US-
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20100024571-$ or US-20150305973-$ or US-
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20110185582-$).did. or (US-20190224765-$ or US-
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20050257384-$ or US-20110107608-$ or US-20140360335-$ or US-20130204255-$ or US-20090326540-$ or US-20050252011-$ or US-20150113815-$ or US-20140007436-$ or US-20070289149-$ or US-20050262710-$ or US-20200069510-$ or US-20190365598-$ or US-20200046602-$ or US-20200093682-$ or US-20180256432-$ or US-20200060918-$ or US-20200000678-$ or US-20130110017-$ or US-20150297437-$ or US-20110224580-$ or US-20190307631-$ or US-20120215141-$ or US-20120215280-$ or US-20150133832-$ or US-20150005672-$).did. or (US-20160278584-$ or US-20130237751-$ or US-20050207609-$ or US-20150335520-$ or US-20150169124-$ or US-20160213558-$ or US-20150119771-$ or US-20190290076-$ or US-20170095398-$ or US-20160151238-$ or US-20160000642-$ or US-20050054958-$ or US-20150290076-$ or US-20160158097-$ or US-20190099327-$ or US-20200214934-$ or US-20200038530-$ or US-20180288160-$ or US-20180279843-$ or US-20170049278-$ or US-20180243158-$ or US-20160303668-$ or US-20180326568-$ or US-20140360029-$ or US-20140194790-$ or US-20090240177-$ or US-20190066833-$).did. or (US-20180008512-$).did. or (US-6663657-$ or US-6228042-$ or US-5951501-$ or US-5569168-$ or US-4549535-$ or US-4173217-$ or US-5273479-$ or US-8715161-$ or US-7927259-$ or US-7041072-$ or US-6733414-$ or US-6723060-$ or US-6682496-$ or US-6599260-$ or US-6352518-$ or US-6027444-$ or US-5716332-$ or US-4827914-$ or US-4790296-$ or US-4513737-$ or US-3837335-$ or US-3626934-$ or US-9827159-$ or US-4716890-$ or US-5140979-$ or US-3754548-$).did. or (US-6786878-$ or US-7238162-$ or US-7128722-$ or US-8951216-$ or US-5460597-$ or US-5417644-$ or US-6730050-$ or US-6432072-$ or US-5695451-$ or US-5475883-$ or US-5085207-$ or US-4162675-$ or US-4088128-$ or US-4079733-$ or US-3724451-$ or US-8342187-$ or US-7590445-$ or US-4730605-$ or US-7951098-$ or US-4025809-$ or US-3580246-$ or US-6228103-$ or US-9161881-$ or US-4566442-$ or US-5983416-$ or US-4722327-$ or US-7367981-$).did. or (US-5676637-$ or US-8777881-$ or US-4834075-$ or US-6500135-$ or US-3806980-$ or US-7503923-$ or US-5300095-$ or US-4841955-$ or US-6730051-$ or US-5843006-$ or US-3747594-$ or US-5214975-$ or US-5203113-$ or US-5640735-$ or US-5374237-$ or US-7996996-$ or US-9724771-$ or US-9606026-$ or US-7059425-$ or US-5655887-$ or US-3854563-$ or US-5573500-$ or US-3736920-$ or US-5088474-$ or US-9265689-$ or US-5803916-$ or US-6805700-$).did. or

		(US-6602211-$ or US-6997889-$ or US-4158246-$ or US-9289348-$ or US-5470303-$ or US-5159922-$ or US-9889066-$ or US-10027201-$ or US-8640347-$ or US-5212887-$ or US-5099705-$ or US-5079844-$ or US-3759020-$ or US-7036401-$ or US-3863342-$ or US-7818887-$ or US-RE36269-$ or US-5083376-$ or US-7448137-$ or US-6671969-$ or US-7096589-$ or US-5940977-$ or US-7127973-$ or US-8813377-$ or US-4976164-$ or US-8656598-$ or US-5170564-$).did. or (US-3971132-$ or US-6772662-$ or US-4272996-$ or US-3942251-$ or US-6212781-$ or US-7191847-$ or US-9192390-$ or US-5832611-$ or US-6264211-$ or US-7251896-$ or US-7370423-$ or US-4150668-$ or US-4817738-$ or US-6557816-$ or US-4563605-$ or US-5129118-$ or US-4420995-$ or US-9333628-$ or US-8475076-$ or US-7954402-$ or US-6971285-$ or US-6964216-$ or US-5660491-$ or US-2964037-$ or US-1882040-$ or US-8322456-$ or US-6938706-$).did. or (US-8561717-$ or US-10357425-$ or US-10428850-$ or US-10470970-$ or US-4283855-$ or US-10525541-$ or US-3876015-$ or US-3834019-$ or US-3805383-$ or US-6357124-$ or US-4240204-$ or US-7509744-$ or US-5007172-$ or US-3706474-$ or US-4991298-$ or US-8960323-$ or US-8578615-$ or US-6282797-$ or US-6634107-$ or US-6662455-$ or US-6758119-$ or US-3785053-$ or US-9221112-$ or US-7109613-$ or US-5624000-$ or US-10314762-$ or US-9543871-$).did. or (US-10702448-$ or US-10517790-$ or US-10420700-$ or US-6648840-$ or US-4697580-$ or US-6568089-$ or US-8702633-$ or US-5113847-$).did. or (US-2964037-$ or US-1882040-$ or US-2902067-$ or US-2868248-$ or US-2822005-$ or US-2808082-$ or US-2240755-$ or US-3309932-$ or US-3545301-$ or US-3172675-$ or US-2839101-$ or US-3050093-$ or US-3340612-$ or US-3623223-$).did. or (EP-1313116-$ or WO-2009014727-$).did. or (JP-07051393-$ or JP-02019157-$ or JP-2005204777-$).did. or (WO-2015038005-$ or WO-2014118596-$ or JP-2010534110-$).did.				
S1197	4	S1196 and ((instruct$4 guide tutorial prompt$) with (step$1by$1step))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/13 11:25
S1198	124	((instruct$4 guide tutorial prompt$) with (step$1by$1step) with (phone smart-phone smartphone cell-phone cellphone tablet))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/13 11:28

S1199	36	("20080262399" | "20100274162" | "20130261516" | "20130281897" | "20140031866" | "20150005682" | "20160367425" | "20170027798" | "20170333280" | "20180008512" | "20180168913" | "20180200141" | "4088128" | "4513737" | "4549535" | "4790296" | "4841955" | "5656017" | "5733029" | "5769657" | "6682496" | "9889066").PN. OR ("10314762").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/13 11:30
S1200	4	(("20130281897") or ("20150310634") or ("20190290076") or ("20150297437")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2020/07/13 11:51
S1201	136	S1196 and ((direct$4 instruct$ prompt$ guid$4 tutorial$) with ((body adj part) area arm leg face))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/13 11:57
S1202	1	("9907439").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2020/07/13 12:40
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S1204	1	("5501657").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2020/07/14 08:46
S1205	386	(US-20140180331-$ or US-20130261516-$ or US-20130138023-$ or US-20120253245-$ or US-20080103419-$ or US-20070150004-$ or US-20060192527-$ or US-20060123941-$ or US-20060025710-$ or US-20030195443-$ or US-20030009116-$ or US-20010016697-$ or US-20160206502-$ or US-20160367425-$ or US-20170027798-$ or US-20030094356-$ or US-20170304145-$ or US-20140163442-$ or US-20130281897-$ or US-20120101517-$ or US-20100137907-$ or US-20100010399-$ or US-20090270915-$ or US-20090222024-$ or US-20020107459-$ or US-20170304144-$).did. or (US-	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2020/07/14 09:49

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		5640735-$ or US-5374237-$ or US-7996996-$ or US-9724771-$ or US-9606026-$ or US-7059425-$ or US-5655887-$ or US-3854563-$ or US-5573500-$ or US-3736920-$ or US-5088474-$ or US-9265689-$ or US-5803916-$ or US-6805700-$).did. or (US-6602211-$ or US-6997889-$ or US-4158246-$ or US-9289348-$ or US-5470303-$ or US-5159922-$ or US-9889066-$ or US-10027201-$ or US-8640347-$ or US-5212887-$ or US-5099705-$ or US-5079844-$ or US-3759020-$ or US-7036401-$ or US-3863342-$ or US-7818887-$ or US-RE36269-$ or US-5083376-$ or US-7448137-$ or US-6671969-$ or US-7096589-$ or US-5940977-$ or US-7127973-$ or US-8813377-$ or US-4976164-$ or US-8656598-$ or US-5170564-$).did. or (US-3971132-$ or US-6772662-$ or US-4272996-$ or US-3942251-$ or US-6212781-$ or US-7191847-$ or US-9192390-$ or US-5832611-$ or US-6264211-$ or US-7251896-$ or US-7370423-$ or US-4150668-$ or US-4817738-$ or US-6557816-$ or US-4563605-$ or US-5129118-$ or US-4420995-$ or US-9333628-$ or US-8475076-$ or US-7954402-$ or US-6971285-$ or US-6964216-$ or US-5660491-$ or US-2964037-$ or US-1882040-$ or US-8322456-$ or US-6938706-$).did. or (US-8561717-$ or US-10357425-$ or US-10428850-$ or US-10470970-$ or US-4283855-$ or US-10525541-$ or US-3876015-$ or US-3834019-$ or US-3805383-$ or US-6357124-$ or US-4240204-$ or US-7509744-$ or US-5007172-$ or US-3706474-$ or US-4991298-$ or US-8960323-$ or US-8578615-$ or US-6282797-$ or US-6634107-$ or US-6662455-$ or US-6758119-$ or US-3785053-$ or US-9221112-$ or US-7109613-$ or US-5624000-$ or US-10314762-$ or US-9543871-$).did. or (US-10702448-$ or US-10517790-$ or US-10420700-$ or US-6648840-$ or US-4697580-$ or US-6568089-$ or US-8702633-$ or US-5113847-$ or US-5501657-$).did. or (US-2964037-$ or US-1882040-$ or US-2902067-$ or US-2868248-$ or US-2822005-$ or US-2808082-$ or US-2240755-$ or US-3309932-$ or US-3545301-$ or US-3172675-$ or US-2839101-$ or US-3050093-$ or US-3340612-$ or US-3623223-$).did. or (EP-1313116-$ or WO-2009014727-$).did. or (JP-07051393-$ or JP-02019157-$ or JP-2005204777-$).did. or (WO-2015038005-$ or WO-2014118596-$ or JP-2010534110-$).did.				
S1206	386	(US-20140180331-$ or US-20130261516-$ or US-20130138023-$ or US-20120253245-$ or US-20080103419-$ or US-20070150004-$ or US-20060192527-$ or US-20060123941-$ or US-20060025710-$ or US-20030195443-$ or US-20030009116-$ or US-20010016697-$ or US-20160206502-$ or US-20160367425-$ or US-20170027798-$ or US-20030094356-$ or US-20170304145-$ or US-20140163442-$ or US-	US-PGPUB; USPAT; USOCR; EPO; JPO;	OR	ON	2020/07/14 10:52

		20130281897-$ or US-20120101517-$ or US- 20100137907-$ or US-20100010399-$ or US- 20090270915-$ or US-20090222024-$ or US- 20020107459-$ or US-20170304144-$).did. or (US- 20170156974-$ or US-20160346152-$ or US- 20160271009-$ or US-20170156975-$ or US- 20030149381-$ or US-20150202114-$ or US- 20130012849-$ or US-20020072693-$ or US- 20130123677-$ or US-20130072837-$ or US- 20100331745-$ or US-20010027280-$ or US- 20030028134-$ or US-20030065280-$ or US- 20020183668-$ or US-20020082536-$ or US- 20140323931-$ or US-20110137217-$ or US- 20110041864-$ or US-20050113636-$ or US- 20090038069-$ or US-20040064074-$ or US- 20090086569-$ or US-20120253246-$ or US- 20170281457-$ or US-20170105896-$ or US- 20070299378-$).did. or (US-20100125228-$ or US- 20060074362-$ or US-20170281459-$ or US- 20040176710-$ or US-20150148592-$ or US- 20080262397-$ or US-20100145242-$ or US- 20030144615-$ or US-20090177128-$ or US- 20170241201-$ or US-20150198219-$ or US- 20090165387-$ or US-20070175647-$ or US- 20050217900-$ or US-20050015030-$ or US- 20100024571-$ or US-20150305973-$ or US- 20160015596-$ or US-20150182411-$ or US- 20160131228-$ or US-20090032275-$ or US- 20030019799-$ or US-20130245511-$ or US- 20040039314-$ or US-20070144310-$ or US- 20180263845-$ or US-20150005682-$).did. or (US- 20180200141-$ or US-20040255475-$ or US- 20040255474-$ or US-20040187324-$ or US- 20040117993-$ or US-20150367494-$ or US- 20150033564-$ or US-20130133210-$ or US- 20090100690-$ or US-20060260141-$ or US- 20050178012-$ or US-20080047150-$ or US- 20120192440-$ or US-20120030955-$ or US- 20030070307-$ or US-20090272617-$ or US- 20180099339-$ or US-20110265335-$ or US- 20110131820-$ or US-20060288594-$ or US- 20080016705-$ or US-20070209217-$ or US- 20190017528-$ or US-20190015294-$ or US- 20130019483-$ or US-20150375315-$ or US- 20110185582-$).did. or (US-20190224765-$ or US- 20180236572-$ or US-20190209424-$ or US- 20180370012-$ or US-20190254921-$ or US- 20060047315-$ or US-20050131461-$ or US- 20020082532-$ or US-20180031089-$ or US- 20190175434-$ or US-20080004554-$ or US- 20050159689-$ or US-20170079865-$ or US- 20190083352-$ or US-20140283394-$ or US- 20170361386-$ or US-20170173711-$ or US-	DERW ENT			

20140182871-$ or US-20090188119-$ or US-20080189961-$ or US-20050126018-$ or US-20010011420-$ or US-20020138991-$ or US-20190351539-$ or US-20160199924-$ or US-20100162579-$ or US-20130014968-$).did. or (US-20080229591-$ or US-20050257385-$ or US-20050257384-$ or US-20110107608-$ or US-20140360335-$ or US-20130204255-$ or US-20090326540-$ or US-20050252011-$ or US-20150113815-$ or US-20140007436-$ or US-20070289149-$ or US-20050262710-$ or US-20200069510-$ or US-20190365598-$ or US-20200046602-$ or US-20200093682-$ or US-20180256432-$ or US-20200060918-$ or US-20200000678-$ or US-20130110017-$ or US-20150297437-$ or US-20110224580-$ or US-20190307631-$ or US-20120215141-$ or US-20120215280-$ or US-20150133832-$ or US-20150005672-$).did. or (US-20160278584-$ or US-20130237751-$ or US-20050207609-$ or US-20150335520-$ or US-20150169124-$ or US-20160213558-$ or US-20150119771-$ or US-20190290076-$ or US-20170095398-$ or US-20160151238-$ or US-20160000642-$ or US-20050054958-$ or US-20150290076-$ or US-20160158097-$ or US-20190099327-$ or US-20200214934-$ or US-20200038530-$ or US-20180288160-$ or US-20180279843-$ or US-20170049278-$ or US-20180243158-$ or US-20160303668-$ or US-20180326568-$ or US-20140360029-$ or US-20140194790-$ or US-20090240177-$ or US-20190066833-$).did. or (US-20180008512-$ or US-20100274162-$ or US-20180196395-$ or US-20150310634-$ or US-20150040685-$ or US-20140194900-$).did. or (US-6663657-$ or US-6228042-$ or US-5951501-$ or US-5569168-$ or US-4549535-$ or US-4173217-$ or US-5273479-$ or US-8715161-$ or US-7927259-$ or US-7041072-$ or US-6733414-$ or US-6723060-$ or US-6682496-$ or US-6599260-$ or US-6352518-$ or US-6027444-$ or US-5716332-$ or US-4827914-$ or US-4790296-$ or US-4513737-$ or US-3837335-$ or US-3626934-$ or US-9827159-$ or US-4716890-$ or US-5140979-$ or US-3754548-$).did. or (US-6786878-$ or US-7238162-$ or US-7128722-$ or US-8951216-$ or US-5460597-$ or US-5417644-$ or US-6730050-$ or US-6432072-$ or US-5695451-$ or US-5475883-$ or US-5085207-$ or US-4162675-$ or US-4088128-$ or US-4079733-$ or US-3724451-$ or US-8342187-$ or US-7590445-$ or US-4730605-$ or US-7951098-$ or US-4025809-$ or US-3580246-$ or US-6228103-$ or US-9161881-$ or US-4566442-$ or US-5983416-$ or US-4722327-$ or US-7367981-$).did. or (US-5676637-$ or

		US-8777881-$ or US-4834075-$ or US-6500135-$ or US-3806980-$ or US-7503923-$ or US-5300095-$ or US-4841955-$ or US-6730051-$ or US-5843006-$ or US-3747594-$ or US-5214975-$ or US-5203113-$ or US-5640735-$ or US-5374237-$ or US-7996996-$ or US-9724771-$ or US-9606026-$ or US-7059425-$ or US-5655887-$ or US-3854563-$ or US-5573500-$ or US-3736920-$ or US-5088474-$ or US-9265689-$ or US-5803916-$ or US-6805700-$).did. or (US-6602211-$ or US-6997889-$ or US-4158246-$ or US-9289348-$ or US-5470303-$ or US-5159922-$ or US-9889066-$ or US-10027201-$ or US-8640347-$ or US-5212887-$ or US-5099705-$ or US-5079844-$ or US-3759020-$ or US-7036401-$ or US-3863342-$ or US-7818887-$ or US-RE36269-$ or US-5083376-$ or US-7448137-$ or US-6671969-$ or US-7096589-$ or US-5940977-$ or US-7127973-$ or US-8813377-$ or US-4976164-$ or US-8656598-$ or US-5170564-$).did. or (US-3971132-$ or US-6772662-$ or US-4272996-$ or US-3942251-$ or US-6212781-$ or US-7191847-$ or US-9192390-$ or US-5832611-$ or US-6264211-$ or US-7251896-$ or US-7370423-$ or US-4150668-$ or US-4817738-$ or US-6557816-$ or US-4563605-$ or US-5129118-$ or US-4420995-$ or US-9333628-$ or US-8475076-$ or US-7954402-$ or US-6971285-$ or US-6964216-$ or US-5660491-$ or US-2964037-$ or US-1882040-$ or US-8322456-$ or US-6938706-$).did. or (US-8561717-$ or US-10357425-$ or US-10428850-$ or US-10470970-$ or US-4283855-$ or US-10525541-$ or US-3876015-$ or US-3834019-$ or US-3805383-$ or US-6357124-$ or US-4240204-$ or US-7509744-$ or US-5007172-$ or US-3706474-$ or US-4991298-$ or US-8960323-$ or US-8578615-$ or US-6282797-$ or US-6634107-$ or US-6662455-$ or US-6758119-$ or US-3785053-$ or US-9221112-$ or US-7109613-$ or US-5624000-$ or US-10314762-$ or US-9543871-$).did. or (US-10702448-$ or US-10517790-$ or US-10420700-$ or US-6648840-$ or US-4697580-$ or US-6568089-$ or US-8702633-$ or US-5113847-$ or US-5501657-$).did. or (US-2964037-$ or US-1882040-$ or US-2902067-$ or US-2868248-$ or US-2822005-$ or US-2808082-$ or US-2240755-$ or US-3309932-$ or US-3545301-$ or US-3172675-$ or US-2839101-$ or US-3050093-$ or US-3340612-$ or US-3623223-$).did. or (EP-1313116-$ or WO-2009014727-$).did. or (JP-07051393-$ or JP-02019157-$ or JP-2005204777-$).did. or (WO-2015038005-$ or WO-2014118596-$ or JP-2010534110-$).did.				
S1207	145	S1206 and ((grip$5 hold$4 handle) with (adjust adjusting adjusted adjustment adjustable position$4 chang$4))	US-PGPUB; USPAT	OR	ON	2020/07/14 10:59

			; USOCR			
S1208	158	S1206 and ((grip$5 hold$4 handle) with (select$5 adjust adjusting adjusted adjustment adjustable position$4 chang$4))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/14 11:00
S1209	2	(("20080177207") or ("20100145242")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2020/07/14 11:40
S1210	387	(US-20140180331-$ or US-20130261516-$ or US-20130138023-$ or US-20120253245-$ or US-20080103419-$ or US-20070150004-$ or US-20060192527-$ or US-20060123941-$ or US-20060025710-$ or US-20030195443-$ or US-20030009116-$ or US-20010016697-$ or US-20160206502-$ or US-20160367425-$ or US-20170027798-$ or US-20030094356-$ or US-20170304145-$ or US-20140163442-$ or US-20130281897-$ or US-20120101517-$ or US-20100137907-$ or US-20100010399-$ or US-20090270915-$ or US-20090222024-$ or US-20020107459-$ or US-20170304144-$).did. or (US-20170156974-$ or US-20160346152-$ or US-20160271009-$ or US-20170156975-$ or US-20030149381-$ or US-20150202114-$ or US-20130012849-$ or US-20020072693-$ or US-20130123677-$ or US-20130072837-$ or US-20100331745-$ or US-20010027280-$ or US-20030028134-$ or US-20030065280-$ or US-20020183668-$ or US-20020082536-$ or US-20140323931-$ or US-20110137217-$ or US-20110041864-$ or US-20050113636-$ or US-20090038069-$ or US-20040064074-$ or US-20090086569-$ or US-20120253246-$ or US-20170281457-$ or US-20170105896-$ or US-20070299378-$).did. or (US-20100125228-$ or US-20060074362-$ or US-20170281459-$ or US-20040176710-$ or US-20150148592-$ or US-20080262397-$ or US-20100145242-$ or US-20030144615-$ or US-20090177128-$ or US-20170241201-$ or US-20150198219-$ or US-20090165387-$ or US-20070175647-$ or US-20050217900-$ or US-20050015030-$ or US-20100024571-$ or US-20150305973-$ or US-20160015596-$ or US-20150182411-$ or US-20160131228-$ or US-20090032275-$ or US-	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2020/07/14 15:27

20030019799-$ or US-20130245511-$ or US-20040039314-$ or US-20070144310-$ or US-20180263845-$ or US-20150005682-$).did. or (US-20180200141-$ or US-20040255475-$ or US-20040255474-$ or US-20040187324-$ or US-20040117993-$ or US-20150367494-$ or US-20150033564-$ or US-20130133210-$ or US-20090100690-$ or US-20060260141-$ or US-20050178012-$ or US-20080047150-$ or US-20120192440-$ or US-20120030955-$ or US-20030070307-$ or US-20090272617-$ or US-20180099339-$ or US-20110265335-$ or US-20110131820-$ or US-20060288594-$ or US-20080016705-$ or US-20070209217-$ or US-20190017528-$ or US-20190015294-$ or US-20130019483-$ or US-20150375315-$ or US-20110185582-$).did. or (US-20190224765-$ or US-20180236572-$ or US-20190209424-$ or US-20180370012-$ or US-20190254921-$ or US-20060047315-$ or US-20050131461-$ or US-20020082532-$ or US-20180031089-$ or US-20190175434-$ or US-20080004554-$ or US-20050159689-$ or US-20170079865-$ or US-20190083352-$ or US-20140283394-$ or US-20170361386-$ or US-20170173711-$ or US-20140182871-$ or US-20090188119-$ or US-20080189961-$ or US-20050126018-$ or US-20010011420-$ or US-20020138991-$ or US-20190351539-$ or US-20160199924-$ or US-20100162579-$ or US-20130014968-$).did. or (US-20080229591-$ or US-20050257385-$ or US-20050257384-$ or US-20110107608-$ or US-20140360335-$ or US-20130204255-$ or US-20090326540-$ or US-20050252011-$ or US-20150113815-$ or US-20140007436-$ or US-20070289149-$ or US-20050262710-$ or US-20200069510-$ or US-20190365598-$ or US-20200046602-$ or US-20200093682-$ or US-20180256432-$ or US-20200060918-$ or US-20200000678-$ or US-20130110017-$ or US-20150297437-$ or US-20110224580-$ or US-20190307631-$ or US-20120215141-$ or US-20120215280-$ or US-20150133832-$ or US-20150005672-$).did. or (US-20160278584-$ or US-20130237751-$ or US-20050207609-$ or US-20150335520-$ or US-20150169124-$ or US-20160213558-$ or US-20150119771-$ or US-20190290076-$ or US-20170095398-$ or US-20160151238-$ or US-20160000642-$ or US-20050054958-$ or US-20150290076-$ or US-20160158097-$ or US-20190099327-$ or US-20200214934-$ or US-20200038530-$ or US-20180288160-$ or US-20180279843-$ or US-

20170049278-$ or US-20180243158-$ or US-20160303668-$ or US-20180326568-$ or US-20140360029-$ or US-20140194790-$ or US-20090240177-$ or US-20190066833-$).did. or (US-20180008512-$ or US-20100274162-$ or US-20180196395-$ or US-20150310634-$ or US-20150040685-$ or US-20140194900-$ or US-20080177207-$).did. or (US-6663657-$ or US-6228042-$ or US-5951501-$ or US-5569168-$ or US-4549535-$ or US-4173217-$ or US-5273479-$ or US-8715161-$ or US-7927259-$ or US-7041072-$ or US-6733414-$ or US-6723060-$ or US-6682496-$ or US-6599260-$ or US-6352518-$ or US-6027444-$ or US-5716332-$ or US-4827914-$ or US-4790296-$ or US-4513737-$ or US-3837335-$ or US-3626934-$ or US-9827159-$ or US-4716890-$ or US-5140979-$ or US-3754548-$).did. or (US-6786878-$ or US-7238162-$ or US-7128722-$ or US-8951216-$ or US-5460597-$ or US-5417644-$ or US-6730050-$ or US-6432072-$ or US-5695451-$ or US-5475883-$ or US-5085207-$ or US-4162675-$ or US-4088128-$ or US-4079733-$ or US-3724451-$ or US-8342187-$ or US-7590445-$ or US-4730605-$ or US-7951098-$ or US-4025809-$ or US-3580246-$ or US-6228103-$ or US-9161881-$ or US-4566442-$ or US-5983416-$ or US-4722327-$ or US-7367981-$).did. or (US-5676637-$ or US-8777881-$ or US-4834075-$ or US-6500135-$ or US-3806980-$ or US-7503923-$ or US-5300095-$ or US-4841955-$ or US-6730051-$ or US-5843006-$ or US-3747594-$ or US-5214975-$ or US-5203113-$ or US-5640735-$ or US-5374237-$ or US-7996996-$ or US-9724771-$ or US-9606026-$ or US-7059425-$ or US-5655887-$ or US-3854563-$ or US-5573500-$ or US-3736920-$ or US-5088474-$ or US-9265689-$ or US-5803916-$ or US-6805700-$).did. or (US-6602211-$ or US-6997889-$ or US-4158246-$ or US-9289348-$ or US-5470303-$ or US-5159922-$ or US-9889066-$ or US-10027201-$ or US-8640347-$ or US-5212887-$ or US-5099705-$ or US-5079844-$ or US-3759020-$ or US-7036401-$ or US-3863342-$ or US-7818887-$ or US-RE36269-$ or US-5083376-$ or US-7448137-$ or US-6671969-$ or US-7096589-$ or US-5940977-$ or US-7127973-$ or US-8813377-$ or US-4976164-$ or US-8656598-$ or US-5170564-$).did. or (US-3971132-$ or US-6772662-$ or US-4272996-$ or US-3942251-$ or US-6212781-$ or US-7191847-$ or US-9192390-$ or US-5832611-$ or US-6264211-$ or US-7251896-$ or US-7370423-$ or US-4150668-$ or US-4817738-$ or US-6557816-$ or US-4563605-$ or US-5129118-$ or US-4420995-$ or US-9333628-$ or US-8475076-$ or US-7954402-$ or US-6971285-$ or US-6964216-$ or US-5660491-$ or US-2964037-$ or US-1882040-$ or US-8322456-$ or US-6938706-$).did. or (US-8561717-$ or US-10357425-$ or US-10428850-$ or

		US-10470970-$ or US-4283855-$ or US-10525541-$ or US-3876015-$ or US-3834019-$ or US-3805383-$ or US-6357124-$ or US-4240204-$ or US-7509744-$ or US-5007172-$ or US-3706474-$ or US-4991298-$ or US-8960323-$ or US-8578615-$ or US-6282797-$ or US-6634107-$ or US-6662455-$ or US-6758119-$ or US-3785053-$ or US-9221112-$ or US-7109613-$ or US-5624000-$ or US-10314762-$ or US-9543871-$).did. or (US-10702448-$ or US-10517790-$ or US-10420700-$ or US-6648840-$ or US-4697580-$ or US-6568089-$ or US-8702633-$ or US-5113847-$ or US-5501657-$).did. or (US-2964037-$ or US-1882040-$ or US-2902067-$ or US-2868248-$ or US-2822005-$ or US-2808082-$ or US-2240755-$ or US-3309932-$ or US-3545301-$ or US-3172675-$ or US-2839101-$ or US-3050093-$ or US-3340612-$ or US-3623223-$).did. or (EP-1313116-$ or WO-2009014727-$).did. or (JP-07051393-$ or JP-02019157-$ or JP-2005204777-$).did. or (WO-2015038005-$ or WO-2014118596-$ or JP-2010534110-$).did.				
S12 11	15	S1210 and ((control controlling controlled controller) with (phone smart-phone smartphone cell-phone cellphone tablet))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/14 15:28
S12 12	7	S1211 and (touchscreen touch-screen (touch adj screen) touchdisplay touch-display (touch adj display))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/14 15:30
S12 13	190	(a61h.cpcl. or "601".clas.) and (((control controlling controlled controller) with (phone smart-phone smartphone cell-phone cellphone tablet)) same (touchscreen touch-screen (touch adj screen) touchdisplay touch-display (touch adj display)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/14 15:44
S12 14	91	(a61h.cpcl. or "601".clas.) and massag$ and (((control controlling controlled controller) with (phone smart-phone smartphone cell-phone cellphone tablet)) same (touchscreen touch-screen (touch adj screen) touchdisplay touch-display (touch adj display)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/14 15:53
S12 16	15	S1210 and (kit)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/14 16:29

S1217	980	(a61h.cpcl. or "601".clas.) and ((treatment massag$) with (head applicator) with (different plural$))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/14 16:31
S1218	6	(a61h.cpcl. or "601".clas.) and ((treatment massag$) with (head applicator) with (different plural$) with kit)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/14 16:32
S1219	12	S1210 and ((plural$ different) with (body adj part))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/14 17:08
S1220	13	S1210 and ((plural$ different multiple) with (body adj part))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/14 17:08
S1221	37	((("Wersland") near3 ("Jason"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/14 17:14
S1222	9	S1221 and (protocol routine step).clm.	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/14 17:14
S1223	5,287	(massag$ percussiv$ percussion$) same (tutorial instruct$4 guide tutorial prompt$ step$1by$1step)	EPO; JPO; DERWENT	OR	ON	2020/07/15 13:51
S1224	123	(massag$ percussiv$ percussion$) same (tutorial instruct$4 guide tutorial prompt$ step$1by$1step) same (phone cellphone cell-phone smart-phone smartphone application)	EPO; JPO; DERWENT	OR	ON	2020/07/15 13:52
S1225	13	((("THERAGUN") near3 ("INC"))).AS,AANM.	USPAT	OR	ON	2020/07/15 16:49

S1226	2	S1225 and (protocol routine step).clm.	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/15 16:50
S1227	49	(US-20080071203-$ or US-20010027280-$ or US-20020161315-$ or US-20020169400-$ or US-20020193712-$ or US-20030028134-$ or US-20040049137-$ or US-20050010141-$ or US-20050049529-$ or US-20050054958-$ or US-20050187498-$ or US-20050222525-$ or US-20060094994-$ or US-20060155224-$).did. or (US-4098266-$ or US-4102334-$ or US-4919117-$ or US-5235967-$ or US-5951501-$ or US-5454779-$ or US-5716332-$ or US-6165145-$ or US-6415814-$ or US-6432072-$ or US-6500135-$ or US-6733466-$ or US-6875186-$ or US-6981954-$ or US-7025736-$ or US-7041072-$ or US-7125390-$ or US-7128722-$ or US-7354408-$ or US-7491184-$ or US-7517328-$ or US-7707654-$ or US-8079968-$ or US-8512265-$ or US-8715161-$ or US-8870796-$).did. or (US-9782324-$ or US-10201470-$ or US-10314762-$ or US-10342649-$ or US-10406065-$ or US-10492984-$ or US-10561574-$ or US-10682281-$ or US-10702448-$).did.	US-PGPUB; USPAT	OR	ON	2020/07/15 16:50
S1228	395	(US-20140180331-$ or US-20130261516-$ or US-20130138023-$ or US-20120253245-$ or US-20080103419-$ or US-20070150004-$ or US-20060192527-$ or US-20060123941-$ or US-20060025710-$ or US-20030195443-$ or US-20030009116-$ or US-20010016697-$ or US-20160206502-$ or US-20160367425-$ or US-20170027798-$ or US-20030094356-$ or US-20170304145-$ or US-20140163442-$ or US-20130281897-$ or US-20120101517-$ or US-20100137907-$ or US-20100010399-$ or US-20090270915-$ or US-20090222024-$ or US-20020107459-$ or US-20170304144-$).did. or (US-20170156974-$ or US-20160346152-$ or US-20160271009-$ or US-20170156975-$ or US-20030149381-$ or US-20150202114-$ or US-20130012849-$ or US-20020072693-$ or US-20130123677-$ or US-20130072837-$ or US-20100331745-$ or US-20010027280-$ or US-20030028134-$ or US-20030065280-$ or US-20020183668-$ or US-20020082536-$ or US-20140323931-$ or US-20110137217-$ or US-20110041864-$ or US-20050113636-$ or US-20090038069-$ or US-20040064074-$ or US-20090086569-$ or US-20120253246-$ or US-20170281457-$ or US-20170105896-$ or US-20070299378-$).did. or (US-20100125228-$ or US-	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2020/07/17 13:49

20060074362-$ or US-20170281459-$ or US-
20040176710-$ or US-20150148592-$ or US-
20080262397-$ or US-20100145242-$ or US-
20030144615-$ or US-20090177128-$ or US-
20170241201-$ or US-20150198219-$ or US-
20090165387-$ or US-20070175647-$ or US-
20050217900-$ or US-20050015030-$ or US-
20100024571-$ or US-20150305973-$ or US-
20160015596-$ or US-20150182411-$ or US-
20160131228-$ or US-20090032275-$ or US-
20030019799-$ or US-20130245511-$ or US-
20040039314-$ or US-20070144310-$ or US-
20180263845-$ or US-20150005682-$).did. or (US-
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20150005672-$).did. or (US-20160278584-$ or US-20130237751-$ or US-20050207609-$ or US-20150335520-$ or US-20150169124-$ or US-20160213558-$ or US-20150119771-$ or US-20190290076-$ or US-20170095398-$ or US-20160151238-$ or US-20160000642-$ or US-20050054958-$ or US-20150290076-$ or US-20160158097-$ or US-20190099327-$ or US-20200214934-$ or US-20200038530-$ or US-20180288160-$ or US-20180279843-$ or US-20170049278-$ or US-20180243158-$ or US-20160303668-$ or US-20180326568-$ or US-20140360029-$ or US-20140194790-$ or US-20090240177-$ or US-20190066833-$).did. or (US-20180008512-$ or US-20100274162-$ or US-20180196395-$ or US-20150310634-$ or US-20150040685-$ or US-20140194900-$ or US-20080177207-$ or US-20150126916-$ or US-20140207032-$).did. or (US-6663657-$ or US-6228042-$ or US-5951501-$ or US-5569168-$ or US-4549535-$ or US-4173217-$ or US-5273479-$ or US-8715161-$ or US-7927259-$ or US-7041072-$ or US-6733414-$ or US-6723060-$ or US-6682496-$ or US-6599260-$ or US-6352518-$ or US-6027444-$ or US-5716332-$ or US-4827914-$ or US-4790296-$ or US-4513737-$ or US-3837335-$ or US-3626934-$ or US-9827159-$ or US-4716890-$ or US-5140979-$ or US-3754548-$).did. or (US-6786878-$ or US-7238162-$ or US-7128722-$ or US-8951216-$ or US-5460597-$ or US-5417644-$ or US-6730050-$ or US-6432072-$ or US-5695451-$ or US-5475883-$ or US-5085207-$ or US-4162675-$ or US-4088128-$ or US-4079733-$ or US-3724451-$ or US-8342187-$ or US-7590445-$ or US-4730605-$ or US-7951098-$ or US-4025809-$ or US-3580246-$ or US-6228103-$ or US-9161881-$ or US-4566442-$ or US-5983416-$ or US-4722327-$ or US-7367981-$).did. or (US-5676637-$ or US-8777881-$ or US-4834075-$ or US-6500135-$ or US-3806980-$ or US-7503923-$ or US-5300095-$ or US-4841955-$ or US-6730051-$ or US-5843006-$ or US-3747594-$ or US-5214975-$ or US-5203113-$ or US-5640735-$ or US-5374237-$ or US-7996996-$ or US-9724771-$ or US-9606026-$ or US-7059425-$ or US-5655887-$ or US-3854563-$ or US-5573500-$ or US-3736920-$ or US-5088474-$ or US-9265689-$ or US-5803916-$ or US-6805700-$).did. or (US-6602211-$ or US-6997889-$ or US-4158246-$ or US-9289348-$ or US-5470303-$ or US-5159922-$ or US-9889066-$ or US-10027201-$ or US-8640347-$ or US-5212887-$ or US-5099705-$ or US-5079844-$ or US-3759020-$ or US-7036401-$ or US-3863342-$ or US-7818887-$ or US-RE36269-$ or US-5083376-$ or US-7448137-$ or US-6671969-$ or US-7096589-$ or US-5940977-$ or US-7127973-$ or US-8813377-$ or US-

		4976164-$ or US-8656598-$ or US-5170564-$).did. or (US-3971132-$ or US-6772662-$ or US-4272996-$ or US-3942251-$ or US-6212781-$ or US-7191847-$ or US-9192390-$ or US-5832611-$ or US-6264211-$ or US-7251896-$ or US-7370423-$ or US-4150668-$ or US-4817738-$ or US-6557816-$ or US-4563605-$ or US-5129118-$ or US-4420995-$ or US-9333628-$ or US-8475076-$ or US-7954402-$ or US-6971285-$ or US-6964216-$ or US-5660491-$ or US-2964037-$ or US-1882040-$ or US-8322456-$ or US-6938706-$).did. or (US-8561717-$ or US-10357425-$ or US-10428850-$ or US-10470970-$ or US-4283855-$ or US-10525541-$ or US-3876015-$ or US-3834019-$ or US-3805383-$ or US-6357124-$ or US-4240204-$ or US-7509744-$ or US-5007172-$ or US-3706474-$ or US-4991298-$ or US-8960323-$ or US-8578615-$ or US-6282797-$ or US-6634107-$ or US-6662455-$ or US-6758119-$ or US-3785053-$ or US-9221112-$ or US-7109613-$ or US-5624000-$ or US-10314762-$ or US-9543871-$).did. or (US-10702448-$ or US-10517790-$ or US-10420700-$ or US-6648840-$ or US-4697580-$ or US-6568089-$ or US-8702633-$ or US-5113847-$ or US-5501657-$ or US-6562013-$ or US-10492984-$ or US-10561574-$).did. or (US-2964037-$ or US-1882040-$ or US-2902067-$ or US-2868248-$ or US-2822005-$ or US-2808082-$ or US-2240755-$ or US-3309932-$ or US-3545301-$ or US-3172675-$ or US-2839101-$ or US-3050093-$ or US-3340612-$ or US-3623223-$).did. or (EP-1313116-$ or WO-2009014727-$).did. or (JP-07051393-$ or JP-02019157-$ or JP-2005204777-$).did. or (WO-2015038005-$ or WO-2014118596-$ or JP-2010534110-$ or CN-210728184-$ or DE-102015226084-$ or WO-2006122435-$).did.				
S1229	99	S1228 and (duration (period near3 time))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/17 13:49
S1230	5	S1228 and ((duration (period near3 time)) with (instruct$5 prompt$4))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/17 13:54
S1231	27	S1228 and ((body near3 part) with (second different differ$4))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/17 13:59

S1232	9	S1228 and (haptic$)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/17 14:12
S1233	395	(US-20140180331-$ or US-20130261516-$ or US-20130138023-$ or US-20120253245-$ or US-20080103419-$ or US-20070150004-$ or US-20060192527-$ or US-20060123941-$ or US-20060025710-$ or US-20030195443-$ or US-20030009116-$ or US-20010016697-$ or US-20160206502-$ or US-20160367425-$ or US-20170027798-$ or US-20030094356-$ or US-20170304145-$ or US-20140163442-$ or US-20130281897-$ or US-20120101517-$ or US-20100137907-$ or US-20100010399-$ or US-20090270915-$ or US-20090222024-$ or US-20020107459-$ or US-20170304144-$).did. or (US-20170156974-$ or US-20160346152-$ or US-20160271009-$ or US-20170156975-$ or US-20030149381-$ or US-20150202114-$ or US-20130012849-$ or US-20020072693-$ or US-20130123677-$ or US-20130072837-$ or US-20100331745-$ or US-20010027280-$ or US-20030028134-$ or US-20030065280-$ or US-20020183668-$ or US-20020082536-$ or US-20140323931-$ or US-20110137217-$ or US-20110041864-$ or US-20050113636-$ or US-20090038069-$ or US-20040064074-$ or US-20090086569-$ or US-20120253246-$ or US-20170281457-$ or US-20170105896-$ or US-20070299378-$).did. or (US-20100125228-$ or US-20060074362-$ or US-20170281459-$ or US-20040176710-$ or US-20150148592-$ or US-20080262397-$ or US-20100145242-$ or US-20030144615-$ or US-20090177128-$ or US-20170241201-$ or US-20150198219-$ or US-20090165387-$ or US-20070175647-$ or US-20050217900-$ or US-20050015030-$ or US-20100024571-$ or US-20150305973-$ or US-20160015596-$ or US-20150182411-$ or US-20160131228-$ or US-20090032275-$ or US-20030019799-$ or US-20130245511-$ or US-20040039314-$ or US-20070144310-$ or US-20180263845-$ or US-20150005682-$).did. or (US-20180200141-$ or US-20040255475-$ or US-20040255474-$ or US-20040187324-$ or US-20040117993-$ or US-20150367494-$ or US-20150033564-$ or US-20130133210-$ or US-20090100690-$ or US-20060260141-$ or US-20050178012-$ or US-20080047150-$ or US-	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2020/07/20 14:07

20120192440-$ or US-20120030955-$ or US-20030070307-$ or US-20090272617-$ or US-20180099339-$ or US-20110265335-$ or US-20110131820-$ or US-20060288594-$ or US-20080016705-$ or US-20070209217-$ or US-20190017528-$ or US-20190015294-$ or US-20130019483-$ or US-20150375315-$ or US-20110185582-$).did. or (US-20190224765-$ or US-20180236572-$ or US-20190209424-$ or US-20180370012-$ or US-20190254921-$ or US-20060047315-$ or US-20050131461-$ or US-20020082532-$ or US-20180031089-$ or US-20190175434-$ or US-20080004554-$ or US-20050159689-$ or US-20170079865-$ or US-20190083352-$ or US-20140283394-$ or US-20170361386-$ or US-20170173711-$ or US-20140182871-$ or US-20090188119-$ or US-20080189961-$ or US-20050126018-$ or US-20010011420-$ or US-20020138991-$ or US-20190351539-$ or US-20160199924-$ or US-20100162579-$ or US-20130014968-$).did. or (US-20080229591-$ or US-20050257385-$ or US-20050257384-$ or US-20110107608-$ or US-20140360335-$ or US-20130204255-$ or US-20090326540-$ or US-20050252011-$ or US-20150113815-$ or US-20140007436-$ or US-20070289149-$ or US-20050262710-$ or US-20200069510-$ or US-20190365598-$ or US-20200046602-$ or US-20200093682-$ or US-20180256432-$ or US-20200060918-$ or US-20200000678-$ or US-20130110017-$ or US-20150297437-$ or US-20110224580-$ or US-20190307631-$ or US-20120215141-$ or US-20120215280-$ or US-20150133832-$ or US-20150005672-$).did. or (US-20160278584-$ or US-20130237751-$ or US-20050207609-$ or US-20150335520-$ or US-20150169124-$ or US-20160213558-$ or US-20150119771-$ or US-20190290076-$ or US-20170095398-$ or US-20160151238-$ or US-20160000642-$ or US-20050054958-$ or US-20150290076-$ or US-20160158097-$ or US-20190099327-$ or US-20200214934-$ or US-20200038530-$ or US-20180288160-$ or US-20180279843-$ or US-20170049278-$ or US-20180243158-$ or US-20160303668-$ or US-20180326568-$ or US-20140360029-$ or US-20140194790-$ or US-20090240177-$ or US-20190066833-$).did. or (US-20180008512-$ or US-20100274162-$ or US-20180196395-$ or US-20150310634-$ or US-20150040685-$ or US-20140194900-$ or US-20080177207-$ or US-20150126916-$ or US-20140207032-$).did. or (US-6663657-$ or US-6228042-$

or US-5951501-$ or US-5569168-$ or US-4549535-$ or US-4173217-$ or US-5273479-$ or US-8715161-$ or US-7927259-$ or US-7041072-$ or US-6733414-$ or US-6723060-$ or US-6682496-$ or US-6599260-$ or US-6352518-$ or US-6027444-$ or US-5716332-$ or US-4827914-$ or US-4790296-$ or US-4513737-$ or US-3837335-$ or US-3626934-$ or US-9827159-$ or US-4716890-$ or US-5140979-$ or US-3754548-$).did. or (US-6786878-$ or US-7238162-$ or US-7128722-$ or US-8951216-$ or US-5460597-$ or US-5417644-$ or US-6730050-$ or US-6432072-$ or US-5695451-$ or US-5475883-$ or US-5085207-$ or US-4162675-$ or US-4088128-$ or US-4079733-$ or US-3724451-$ or US-8342187-$ or US-7590445-$ or US-4730605-$ or US-7951098-$ or US-4025809-$ or US-3580246-$ or US-6228103-$ or US-9161881-$ or US-4566442-$ or US-5983416-$ or US-4722327-$ or US-7367981-$).did. or (US-5676637-$ or US-8777881-$ or US-4834075-$ or US-6500135-$ or US-3806980-$ or US-7503923-$ or US-5300095-$ or US-4841955-$ or US-6730051-$ or US-5843006-$ or US-3747594-$ or US-5214975-$ or US-5203113-$ or US-5640735-$ or US-5374237-$ or US-7996996-$ or US-9724771-$ or US-9606026-$ or US-7059425-$ or US-5655887-$ or US-3854563-$ or US-5573500-$ or US-3736920-$ or US-5088474-$ or US-9265689-$ or US-5803916-$ or US-6805700-$).did. or (US-6602211-$ or US-6997889-$ or US-4158246-$ or US-9289348-$ or US-5470303-$ or US-5159922-$ or US-9889066-$ or US-10027201-$ or US-8640347-$ or US-5212887-$ or US-5099705-$ or US-5079844-$ or US-3759020-$ or US-7036401-$ or US-3863342-$ or US-7818887-$ or US-RE36269-$ or US-5083376-$ or US-7448137-$ or US-6671969-$ or US-7096589-$ or US-5940977-$ or US-7127973-$ or US-8813377-$ or US-4976164-$ or US-8656598-$ or US-5170564-$).did. or (US-3971132-$ or US-6772662-$ or US-4272996-$ or US-3942251-$ or US-6212781-$ or US-7191847-$ or US-9192390-$ or US-5832611-$ or US-6264211-$ or US-7251896-$ or US-7370423-$ or US-4150668-$ or US-4817738-$ or US-6557816-$ or US-4563605-$ or US-5129118-$ or US-4420995-$ or US-9333628-$ or US-8475076-$ or US-7954402-$ or US-6971285-$ or US-6964216-$ or US-5660491-$ or US-2964037-$ or US-1882040-$ or US-8322456-$ or US-6938706-$).did. or (US-8561717-$ or US-10357425-$ or US-10428850-$ or US-10470970-$ or US-4283855-$ or US-10525541-$ or US-3876015-$ or US-3834019-$ or US-3805383-$ or US-6357124-$ or US-4240204-$ or US-7509744-$ or US-5007172-$ or US-3706474-$ or US-4991298-$ or US-8960323-$ or US-8578615-$ or US-6282797-$ or US-6634107-$ or US-6662455-$ or US-6758119-$ or US-3785053-$ or US-9221112-$ or US-7109613-$ or US-5624000-$ or US-10314762-$ or US-9543871-$).did. or

		(US-10702448-$ or US-10517790-$ or US-10420700-$ or US-6648840-$ or US-4697580-$ or US-6568089-$ or US-8702633-$ or US-5113847-$ or US-5501657-$ or US-6562013-$ or US-10492984-$ or US-10561574-$).did. or (US-2964037-$ or US-1882040-$ or US-2902067-$ or US-2868248-$ or US-2822005-$ or US-2808082-$ or US-2240755-$ or US-3309932-$ or US-3545301-$ or US-3172675-$ or US-2839101-$ or US-3050093-$ or US-3340612-$ or US-3623223-$).did. or (EP-1313116-$ or WO-2009014727-$).did. or (JP-07051393-$ or JP-02019157-$ or JP-2005204777-$).did. or (WO-2015038005-$ or WO-2014118596-$ or JP-2010534110-$ or CN-210728184-$ or DE-102015226084-$ or WO-2006122435-$).did.				
S1234	2	S1233 and ((wireless wire-less (wire adj less)) near3 charg$4)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/20 14:15
S1235	106	S1233 and (motor near3 mount$3)	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/20 14:40
S1236	23	S1233 and (motor near3 (brushless brush-less (brush adj less)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/20 14:41
S1237	8	S1236 and S1235	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/20 14:43
S1239	9,092	(a61h.cpcl. or b23d.cpcl. or b26d.cpcl. or a61b.cpcl. or b27b.cpcl. or "83".clas. or "30".clas. or "173".clas. or "227".clas. or "144".clas. or "125".clas. or "76".clas. or "601".clas.) and (motor adj (mount$3 bracket plate frame))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/20 17:47
S1240	1,005	(a61h.cpcl. or b23d.cpcl. or b26d.cpcl. or a61b.cpcl. or b27b.cpcl. or "83".clas. or "30".clas. or "173".clas. or "227".clas. or "144".clas. or "125".clas. or "76".clas. or "601".clas.) and ((motor adj (mount$3 bracket plate frame)) same (reciprocat$ pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/20 17:48

S1241	296	(a61h.cpcl. or b23d.cpcl. or b26d.cpcl. or a61b.cpcl. or b27b.cpcl. or "83".clas. or "30".clas. or "173".clas. or "227".clas. or "144".clas. or "125".clas. or "76".clas. or "601".clas.) and ((motor adj (mount mounting bracket plate frame)) same (reciprocat$ pushrod push-rod (push adj rod)))	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/20 17:50
S1242	49	("20040064907" | "20040074025" | "20040232194" | "20070180711" | "20080017689" | "20080048000" | "20090236387" | "20090250500" | "20100162579" | "20100213236" | "20100276168" | "2373842" | "2726689" | "2894489" | "3939599" | "4081704" | "4323127" | "5246414" | "5479709" | "5558166" | "5581891" | "5624000" | "5692421" | "5960687" | "6520397" | "6619527" | "6935547" | "6971951" | "7011243" | "7040520" | "7107670" | "7107944" | "7109613" | "7117582" | "7118018" | "7140331" | "7305941" | "7513845" | "7568602" | "7690283" | "7703856" | "7850145" | "7938305" | "7959415" | "RE40643").PN. OR ("9221112").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2020/07/20 17:56

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S533	0	(massag$ and (housing cover$) and motor and (power electrical battery) and (trigger switch button) and (output) and (treatment adj (structure head element)) and (frequency with amplitude with reciprocat$) and (shaft drive) and (gear$) and (eccentric$) and ((containment (scotch adj yoke)) with (bracket strut) with (step$3))).clm.	US-PGPUB; USPAT	OR	ON	2019/05/25 18:08
S534	0	((housing cover$) and motor and (power electrical battery) and (trigger switch button) and (output) and (treatment adj (structure head element)) and (frequency with amplitude with reciprocat$) and (shaft drive) and (gear$) and (eccentric$) and ((containment (scotch adj yoke)) with (bracket strut) with (step$3))).clm.	US-PGPUB; USPAT	OR	ON	2019/05/25 18:08
S535	0	((output) and (treatment adj (structure head element)) and (frequency with amplitude with reciprocat$) and (shaft drive) and (gear$) and (eccentric$) and ((containment (scotch adj yoke)) with (bracket strut) with (step$3))).clm.	US-PGPUB; USPAT	OR	ON	2019/05/25 18:08
S536	0	((frequency with amplitude with reciprocat$) and (shaft drive) and (gear$) and (eccentric$) and ((containment (scotch adj yoke)) with (bracket strut) with (step$3))).clm.	US-PGPUB; USPAT	OR	ON	2019/05/25 18:08

S537	0	((frequency with amplitude with reciprocat$) and (shaft drive) and (gear$) and (eccentric$) and ((containment (scotch adj yoke)) with (step$3))).clm.	US-PGPUB; USPAT	OR	ON	2019/05/25 18:10

7/21/2020 5:02:20 PM
C:\Users\cstuart\Documents\EAST\Workspaces\16869389 UPDATED.wsp

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

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	16869402
Filing Date	2020-05-07
First Named Inventor	Wersland, Jason
Art Unit	3785
Examiner Name	Stuart, Colin W.
Attorney Docket Number	76840-5077

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	3626934		1971-12-14	Andis	
	2	4150668		1979-04-24	Johnston	
	3	4173217		1979-11-06	Johnston	
	4	4566442		1986-01-28	Mabuchi	
	5	4730605		1988-03-15	Noble et al.	
	6	5085207		1992-02-04	Fiore	
	7	5417644		1995-05-23	Lee et al.	
	8	5569168		1996-10-29	Hartwig	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /C.W.S/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16869402
	Filing Date	2020-05-07
	First Named Inventor	Wersland, Jason
	Art Unit	3785
	Examiner Name	Stuart, Colin W.
	Attorney Docket Number	76840-5077

	9	5573500		1996-11-12	Katsunuma	
	10	5951501		1999-09-14	Griner	
	11	6228042		2001-05-08	Dungan	
	12	6663657		2003-12-16	Miller	
	13	8951216		2015-02-10	Yoo et al.	
	14	6682496	B1	2004-01-27	JAKE PIVAROFF	
	15	8342187	B2	2013-01-01	Kalman	
	16	4549535		1985-10-29	Wing	
	17	7927259	B1	2011-04-19	Rix	
	18	5212887		1993-05-25	Farmerie	
	19	7996996	B2	2011-08-16	Hirabayashi	

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	Filing Date	2020-05-07
	First Named Inventor	Wersland, Jason
	Art Unit	3785
	Examiner Name	Stuart, Colin W.
	Attorney Docket Number	76840-5077

	20	3545301		1970-12-08	Richter	
	21	3942251		1976-03-09	Griffies	
	22	3172675		1965-03-09	Gonzalez	
	23	10314762		2019-06-11	Marton	

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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
	1	20010016697		2001-08-23	Gorsen	
	2	20030009116		2003-01-09	Luettgen	
	3	20030195443		2003-10-16	Miller	
	4	20060025710		2006-02-02	Schulz	
	5	20060192527		2006-08-31	Kageler	

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	7	20080103419		2008-05-01	Adamson	
	8	20120253245		2012-10-04	Stanbridge	
	9	20140180331		2014-06-26	Turner	
	10	20150148592		2015-05-28	Kanbar	
	11	20150005682		2015-02-12	Kato	
	12	20150005682	A1	2015-01-01	Danby	
	13	20130138023	A1	2013-05-30	Lerro	
	14	20030144615	A1	2003-07-31	Lin	
	15	20060123941	A1	2006-06-15	Wadge	
	16	20130261516	A1	2013-10-03	Cilea	

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	17	20130281897	A1	2013-10-24	Hoffmann	
	18	20070144310	A1	2007-06-28	Pozgay	
	19	20130133210	A1	2013-05-30	Weir	
	20	20030094356	A1	2003-05-22	Waldron	
	21	20180236572	A1	2018-08-23	Ukai	
	22	20150375315	A1	2015-12-31	Ukai	

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	2	2015038005	WO		2015-03-19	Nevroflex AS		
	3	2009014727	WO		2009-01-29	Activator Methods International Limite		

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	5	1995051393	JP		1995-02-28	Hitachi Metals Ltd.		
	6	003077837	JP		2001-06-00	unknown		
	7	1990019157	JP		1990-01-23	Sanden Eng. KK		
	8	2005204777	JP		2005-04-08	Omron Healthcare Ltd		
	9	101123926	KR		2012-04-13	AT System Co Ltd		

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	1	PCT/US2016/038326 International Search Report & Written Opinion dated 01 September 2016	
	2	PCT/US2018/022426 International Search Report & Written Opinion dated 31 May 2018	
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	6	WORX Trans4mer "Safety and Operating Manual Original Instructions" for 12V Li-Ion Multi-purpose saw, WX540, WX540.3, WX540.9, 2013	
	7	Rachel [no family name indicated], "Jigsaw Massager", April 18, 2010 (https://web.archive.org/web/20100418041422/http://www.instructables.com/id/Jigsaw-Massager/)	
	8	Rockwell Trans4mer Operating Manual for Multi-purpose saw, Model RK2516/RK2516K, 2011	

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CERTIFICATION STATEMENT

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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	/Brennan C. Swain/	Date (YYYY-MM-DD)	2020-06-24
Name/Print	Brennan C. Swain	Registration Number	43175

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4098266 99
4102334 99
4919117 99
5235967 99
20080071203 99
5951501 82
5454779 79
5716332 79
6165145 79
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Filing Date	2020-05-07
First Named Inventor	Wersland, Jason
Art Unit	3785
Examiner Name	Stuart, Colin W.
Attorney Docket Number	76840-5077

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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	3626934		1971-12-14	Andis	
	2	4150668		1979-04-24	Johnston	
	3	4173217		1979-11-06	Johnston	
	4	4566442		1986-01-28	Mabuchi	
	5	4730605		1988-03-15	Noble et al.	
	6	5085207		1992-02-04	Fiore	
	7	5417644		1995-05-23	Lee et al.	
	8	5569168		1996-10-29	Hartwig	

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	9	5573500		1996-11-12	Katsunuma	
	10	5951501		1999-09-14	Griner	
	11	6228042		2001-05-08	Dungan	
	12	6663657		2003-12-16	Miller	
	13	8951216		2015-02-10	Yoo et al.	
	14	6682496	B1	2004-01-27	JAKE PIVAROFF	
	15	8342187	B2	2013-01-01	Kalman	
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Signature	/Brennan C. Swain/	Date (YYYY-MM-DD)	2020-06-24
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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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7 May 2018

Examination report No. 1 for standard patent application

Davies Collison Cave Pty Ltd
Level 14
255 Elizabeth Street
Sydney NSW 2000
Australia

Your reference	35278088/WXH
Application number	2016284030
Applicant name	Theragun, LLC
Earliest priority date	20 June 2015

Final date for acceptance:	**7 May 2019**
Date of this report:	7 May 2018
Examination request date:	19 January 2018

Dear Davies Collison Cave Pty Ltd,

Your application has been examined under *section 45 of the Patents Act 1990*. I consider that this application does not meet the requirements of the Act because there are issues with the application that are explained in the report details.

You have **12 months** from the date of this report to overcome all my objection(s) otherwise this application will lapse.

You will also need to pay any annual continuation fees that apply. Your next continuation fee is due on **20 June 2020**.

NOTE: There is a current postponement of acceptance in place. If you overcome all other objections before the expiration of that postponement, the Commissioner will only accept the application at that time if you have filed a clear and unambiguous statement requesting the withdrawal of that postponement. Otherwise, a further adverse report will be issued.

Details of this patent application can be viewed on AusPat, our Australian patent search database.

Yours sincerely,

Timothy Williams
Section: MECH 4 – MEDICAL DEVICES
Phone: (612) 6283 2067

Report details

Basis of the report

In examining this application I have considered:

- the PCT pamphlet as originally filed

Summary of novelty, inventive step and patentable subject matter

	Satisfy requirements?	*Claim numbers*
Novelty/inventive step	**Yes**	NONE
	No	1-20
Patentable subject matter	**Yes**	1-20
	No	NONE

Detailed objections on issues that have been identified

Documents cited or considered relevant

D1 : US 6228042 B1 (DUNGAN) 08 May 2001 #
Category: **X** Claims: 1-20

Cited in the International Search Report and the IPRPI

Special categories of cited documents:

X: The claimed invention cannot be considered novel under *subsection 7(1)* in light of the document and/or cannot be considered to involve an inventive step under *subsection 7(2)* of the Act in light of the common general knowledge considered together with the document.

Novelty and inventive step

1 Independent claim 1, 18 and 20 are not novel and lack an inventive step in light of prior art document D1 discussed in Box V of the IPRPI. While the objection regarding this document was not made under Australian law, I agree with the reasons given in that report and consider that they support a corresponding objection against the Australian claims (see Abstract, Figure 2, Column 3 Line 25-57, Column 4 Line 36-44, Column 5 Line 67-Column 6 Line 16).

Furthermore, I have considered each of the appended claims 2-17 and 19. Each of these claims is not considered to make any patentable contribution over the teachings of D1. The relevant features of these claims are either disclosed in D1 or are considered to represent routine design variation in the state of the art and which therefore cannot contribute to providing novelty or an inventive step. For example, document D1 discloses key features relating to dependent claims 2-3 regarding the treatment structure comprising a compliant material or a polymer (see Column 6 Line 10-16).

END OF REPORT

18 October 2018 (18-10-2018)

GOWLING WLG (CANADA) LLP
CIPO@gowlingwlg.com

Application No.	:	**2,990,178**
PCT No.	:	**US2016038326**
Owner	:	THERAGUN, LLC
Title	:	**APPARATUS, SYSTEM, AND METHOD FOR A RECIPROCATING TREATMENT DEVICE**
Classification	:	A61H 23/00 (2006.01)
Your File No.	:	**V812221CA**
Examiner	:	Christine Lord

YOU ARE HEREBY NOTIFIED OF A REQUISITION BY THE EXAMINER IN ACCORDANCE WITH SUBSECTION 30(2) OF THE *PATENT RULES*. IN ORDER TO AVOID ABANDONMENT UNDER PARAGRAPH 73(1)(*a*) OF THE *PATENT ACT*, A WRITTEN REPLY MUST BE RECEIVED WITHIN THE **SIX (6)** MONTH PERIOD AFTER THE ABOVE DATE.

This application has been examined taking into account the:

Description,	pages 1 to 13, as originally filed;
Claims,	1 to 20, as originally filed; and
Drawings,	pages 1/13 to 13/13, as originally filed.

The number of claims in this application is 20.

The examiner has identified the following defects in the application:

Claims 1 to 4, 11, 13, 14 and 18 to 20 do not comply with section 28.2 of the Patent Act. In the present case the claim set on file is identical to the claim set that was examined in the International Preliminary Report on Patentability (IPRP), which concluded that claims 1 to 4, 11, 13, 14 and 18 to 20 lack novelty as required under PCT Article 33(2). The prior art cited in the IPRP and the detailed reasons supporting a lack of novelty have been considered and are found to be relevant and persuasive with respect to anticipation and section 28.2 of the Patent Act. Claims 1 to 4, 11, 13, 14 and 18 to 20 encompass subject-matter that, in light of the teachings of the cited prior art, has been previously disclosed and enabled. Claims 1 to 4, 11, 13, 14 and 18 to 20 are therefore anticipated and do not comply with section 28.2 of the Patent Act.

Claims 1 to 20 do not comply with section 28.3 of the Patent Act. In the present case the claim set on file is identical to the claim set that was examined in the International Preliminary Report on Patentability (IPRP) which concluded that claims 1 to 20 lack an inventive step as required under PCT Article 33(3). The prior art cited in the IPRP and the detailed reasons supporting a lack of inventive step have been considered and are found to be relevant and persuasive with respect to obviousness and section 28.3 of the Patent Act. Claims 1 to 20 encompass subject-matter that, in

light of the teachings of the cited prior art, do not require any degree of inventiveness and would have been obvious. Claims 1 to 20 therefore do not comply with section 28.3 of the Patent Act.

The description contains a statement that incorporates by reference another document and does not comply with subsection 81(1) of the *Patent Rules*. Such a statement is found at paragraph 0001 and should be removed.

The application does not comply with section 37 of the *Patent Act*. As the alleged invention admits of illustration by means of drawings, the applicant must furnish drawings of the invention that clearly show all parts of the invention. In particular, it would appear that the feature of the battery, the motor, the linkage to convert rotary motion, the trigger lock and the plus introduced in claims 1, 11, 16 and 19 respectively are not represented in the figures.

In line with Canadian practice, it is recommended to use metric system units throughout the claims (see claims 6 to 7 and 12), where imperial unit references may be included in parenthesis.

In view of the foregoing defects, the applicant is requisitioned, under subsection 30(2) of the *Patent Rules*, to amend the application in order to comply with the *Patent Act* and the *Patent Rules* or to provide arguments as to why the application does comply.

Under section 34 of the *Patent Rules*, any amendment made in response to this requisition must be accompanied by a statement explaining the nature thereof, and how it corrects each of the above identified defects.

Christine Lord
Patent Examiner
819-639-7867

As per CIPO Client Service Standards, a response to a telephone enquiry or voice mail should be provided by the end of the next business day. In the event that attempts to reach the examiner are unsuccessful, the examiner's Section Head, Andrew Davidson, can be reached at 819-639-7790.

For general inquiries: 1-866-997-1936 or for more options see http://www.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/eng/wr00006.html.

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The Examination Search Report is provided for reference only and is not part of any requisition made by the examiner in accordance with the *Patent Act* or *Rules*. The applicant is not required to respond to the information contained in the Examination Search Report.

Examination Search Report

Box I: General Information

Application No.	2,990,178	Search Report Date	2018-10-15
Title	APPARATUS, SYSTEM, AND METHOD FOR A RECIPROCATING TREATMENT DEVICE		
Examiner	Christine Lord	Search Conducted?	Yes

Box II: Family Prosecution

Family Member	File Wrapper Reviewed	Status of Prosecution
WO2016209759A1	2018-10-15	Completed
US2016367425A1	2018-10-15	In Progress
EP3310317A1	2018-10-15	In Progress
AU2016284030A1	2018-10-15	In Progress

Box III: Search History

Claims Searched	All	Date of Search	2018-09-28

Type of Search Conducted (select all that apply):

Canadian first to file search	■	Supplemental/top up search	■
Inventor/applicant search	■	Non laid open search	□
Comprehensive search	□	In-house searcher	□

Search History from Databases Consulted:

```
##### CANADIAN PATENT DATABASE/INTELLECT ##########

Query  Number of Hits

 (( WERSLAND <NEAR>  JASON  )  <IN> Inventor) <OR> (( THERAGUN ) <IN> applicant)      1
(filing-date <= 2017-06-20 <AND> filing-date > 1000-01-01 ) <AND> (filing-date
>=2011-06-20) <AND> ((A61H 23/00 <OR> A61H 1/00 <OR> A61H 23/02) <IN> ipc)      146


##### QUESTEL-ORBIT ##########

Base: FAMPAT
Query  Number of Hits
```

```
 ((  WERSLAND 3D  JASON ))/IN OR ((  THERAGUN))/PA   2
..similarity ca2990178/pn and (motor and trigger and battery)/bi/tx      432
..citb ca2990178/pn 23
```

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Jigsaw Massager



Intro: **Jigsaw Massager**

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Better than anyone's thumbs... this produces a really amazing Thump.

I saw Stig's version of this at the last Instructables Show & Tell. I was enraptured. I had to have one, and of course that meant I had to make one.

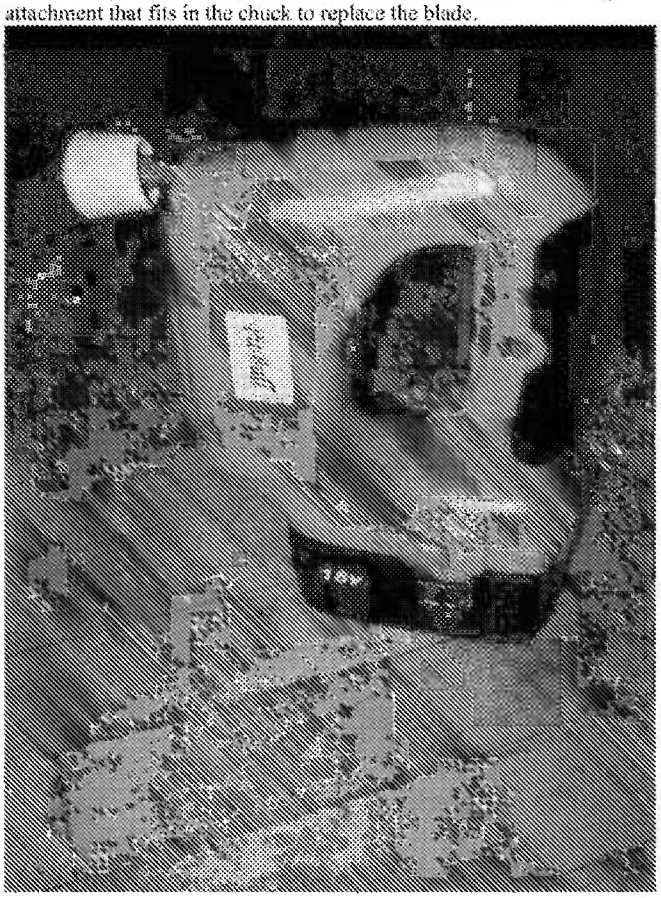
Materials:

- a power jigsaw. cordless is ideal; bladeless is fine; quiet motor is best. I spent about two weeks not finding anything like this in thrift stores or on eBay and finally bought a new, cheap-ass jigsaw off Amazon for about $30.
- one of those old keys you have lying around that you can't remember what it's for. brass is better than aluminum.
- a rubber foot for the bottom of a chair leg. 1 inch diameter is a good size
- Bondo or similar hard-curing filler

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- Dremel with grinding tip (or metal file, if it's all you've got)
- popsicle stick or plastic spoon or some such to mix the bondo
- screwdriver of whatever sort your jigsaw comes apart with (mine took a hex wrench)

This is really a very easy project. All you have to do is remove the parts of the jigsaw that have to do with actually sawing, and create a thumping attachment that fits in the chuck to replace the blade.



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step 1 Prep the jigsaw

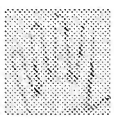
Remove the base plate from the jigsaw using whatever means are appropriate to the jigsaw you've got. Mine, as noted, needed a hex wrench. It is not strictly necessary to remove any plastic as I did from around the chuck assembly, but I found it difficult to get the hex wrench in to loosen the chuck. (Chuck may be the wrong term but I mean the clamp that holds the bla…

step 2 Make the pounder foot

This contraption is the part that hits you in the shoulder so wonderfully. There are any number of ways you could do this but here's what I did. Take the key and see how close it is to fitting into the chuck of the jigsaw. It'll be a lot thicker than a blade so most likely you'll need to grind it down. Note that the pictures show two different keys as I made two of th…







step 3 Fix the pounding foot into the chuck and massage away

Insert the key into the chuck and tighten it down well (you don't want it flying off during use). It's easier to use on someone else but possible to massage yourself. As demonstrated, it's good practice to start the jigsaw engine before approaching the muscle with the pounding foot.

14 comments Add Comment

RedGreenEgg says:
Good idea! I'm gonna give it a try!

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chuck.

REPLY



jeff.o says: Jan 4, 2009, 7:40 PM

Hey, all you need is a 12" blade for that saw and you're good to go! Just make sure you don't cut through the table, too...

REPLY



markb688 says: Jul 7, 2009, 3:05 PM

Actually you can use a jigsaw blade, its easier to fit than a key. Use the blade the jigsaw came with and file the teeth down so what's left looks like a popsicle stick. I used a compound called, "Cold Steel", and the massager works great.

REPLY



mesl says: Oct 15, 2008, 3:57 PM

This was my idea. Thank you that you made it work. Now I am more confident of myself. will try it soon. Best wishes.

REPLY



kneelan2183 says: Jul 23, 2008, 1:48 PM

ouch.

REPLY



lrallard says: Sep 7, 2007, 1:05 AM

A tad loud; perhaps, not the soothing I would want from a massage, but it gets the job done.

REPLY



rachel(author) says: Sep 7, 2007, 9:36 AM

This one is definitely too loud, I'd say, at this point, that loudness is probably the most important quality to look for in a jigsaw if you're going to do this. I have some ideas about covering it to try and cut down on some of the noise, but haven't made any attempt yet. If I do get any success at this I'll add on to the instructable.

REPLY



SFHandyman says: Aug 29, 2007, 1:20 PM

That is so great! I love tools. It's about time they returned the love. (Just talking about the shoulder massage). If you still have the clear plastic dust shield - I'd pop it back on so your hair doesn't slip into the hole in the plastic and get caught on something.

REPLY



Andrew_Modderl says: Aug 28, 2007, 4:49 PM

cool, BUT the loud noise will make me NOT want to use it :-\

REPLY



zachnimus says: Aug 28, 2007, 2:32 PM

Cool! You look like you need sleep, though! Hang in there! You should keep the vibrating pillow on your desk or something, so when you try to fall asleep, it'll wake you up!

REPLY



Weissensteinburg says: Aug 28, 2007, 12:13 PM

Is this what you do when you're trying to not sleep? =]

REPLY



ssully69 says: Aug 28, 2007, 10:52 AM

kool idea!

REPLY



tinker says: Aug 28, 2007, 8:22 AM

Slick! When I first saw your idea -- but before I read your procedure, I was worried that you may have used an old jigsaw blade instead of the key. I was worried that a blade could break free from the Bondo, puncture the tip, and turn the "massager" into sort-of a "tatooee." :-) The key has the advantage of a hole for the Bondo to flow thru and hold the key, plus the handle of the key is very blunt. I suppose the paranoid could drop a washer or coin into the bottom of the tip before embedding everything in Bondo.

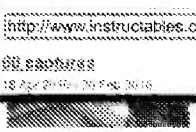
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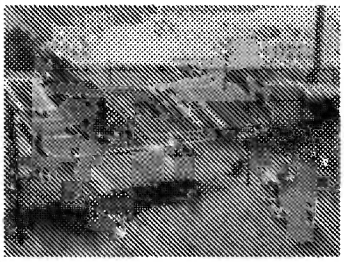
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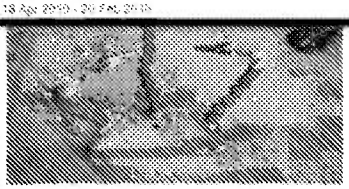
Ask it!

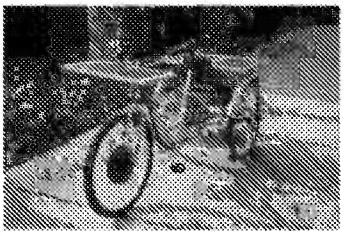
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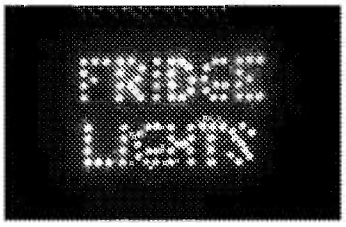
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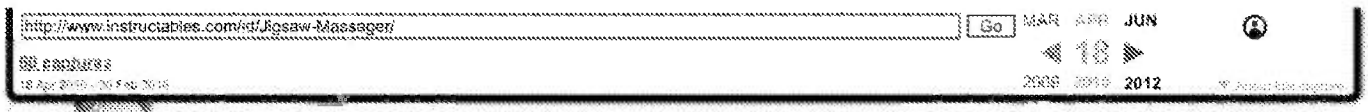


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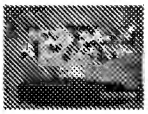
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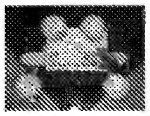
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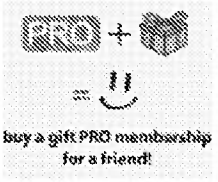
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Mailing Date: October 2, 2018

NOTICE OF REASONS FOR REJECTION

(TRANSLATION)

Patent Application Number: 2018-517683
Drafting Date: September 21, 2018
Patent Office Examiner: Mutsumu Kobayashi 8375 3E00
Attorney for Patent Applicant: Atsushi Aoki et al.
Applicable Provisions: Article 29, paragraph 1; Article 29, paragraph 2; Article 36; and Article 37

It is deemed that this application should be rejected for the reasons given below. Any argument should be submitted in writing within three months from the mailing date of this notice.

REASONS

1. (Unity of invention) This application does not satisfy the requirements prescribed in Article 37 of the Patent Law, on the points indicated in the remarks below.

2. (Clarity) The claim statement is deemed defective on the points indicated in the remarks below, and therefore this application does not satisfy the requirements prescribed in Article 36, paragraph 6, item 2 of the Patent Law.

3. (Novelty) The invention described in the claims, indicated in the remarks below, of this application is the invention described in the publication, indicated in the remarks below, distributed domestically or abroad, or made available to the public through electric telecommunication lines, prior to the filing of the present application, and therefore is unpatentable under Article 29, paragraph 1, item 3 of the Patent Law.

4. (Inventive step) The invention described in the claims, indicated in the remarks below, of this application is one which could easily have been made, prior to the filing of the present application, by a person with ordinary skill in the art to which the invention pertains, on the basis of the invention described in the publications cited in the remarks below, distributed domestically or abroad, or made available to the public through electric

telecommunication lines, prior to the filing of the present application, and therefore is unpatentable under the provisions of Article 29, paragraph 2 of the Patent Law.

REMARKS

(See the List of Cited References for the numbers of the cited references, etc.)

Regarding Reason 1 (Unity of invention)

1. Determination of claims to be examined based on special technical feature

The invention according to claim 1 lacks novelty over References 1 to 3 and does not have a special technical feature. Next, a special technical feature a battery, a motor, a trigger in electrical communication with the battery and the motor, the trigger configured to selectively provide power from the battery to the motor, an actuated output operatively connected to the motor configured to reciprocate in response to activation of the motor, and a treatment structure operatively connected to the actuated output, wherein the treatment structure has a substantially spherical shape is found in the invention according to claim 4.

Thus, the inventions according to claims 1 to 4, for which a determination on the presence or absence of a special technical feature has been made, were examined.

2. Determining subject to be examined based on efficiency of examination

The inventions according to claims 5 to 17 are inventions of the same category including all of the specific features of the invention according to claim 1, and were added to be examined.

The inventions according to claims 18 and 19 are inventions for which it is efficient to conduct an examination collectively with the inventions selected to be examined based on the special technical feature, and were added to be examined.

The inventions of claim 20 is not inventions which include all of the features of the invention of claim 1 and belong to the same category as the invention of claim 1. In addition, as a result of examination of the inventions of claims determined to be the subject of examination based on special technical features, the inventions of claim 20 is not inventions for which examination could be carried out without conducting substantial additional prior art searches and additional examination based thereon, and there are no other conditions under which all of these inventions could be efficiently examined together.

Accordingly, the invention of claim 20 cannot be the subject of examination for requirements other than Article 37 of the Patent Law.

Regarding Reason 2 (Clarity)

· Claim 12

Claim 12 recites that the reciprocating motion of the actuated output has an amplitude between *one inch and one quarter inch*. However, this appears to be an error of ...an amplitude between *one quarter inch and one inch*.

Regarding Reason 3 (Novelty) and Reason 4 (Inventive step)

· Claims 1, 2 and 11

· References 1 to 3

· Remarks

Reference 1 (refer specifically to paragraphs [0019] to [0037] and FIGS. 1 to 16) discloses a portable acupressure therapy orthopedic appliance 100 (corresponding to the reciprocal treatment device) comprising a battery 112 (corresponding to the battery), a DC motor 114 (corresponding to the motor), a trigger 104 (corresponding to the trigger) in electrical communication with the battery 112 and the DC motor 114, the trigger 104 configured to selectively provide power from the battery 112 to the DC motor 114, a force transmission pin 162 (corresponding to the actuated output) operatively connected to the DC 114 motor configured to reciprocate in response to activation of the DC motor 114, and a tip tool 166 (corresponding to the treatment structure) operatively connected to the force transmission pin 162.

Reference 1 discloses that the tip tool 166 includes a cushion. It is deemed that the tip tool 166 comprises a compliant material (the configuration of claim 2).

Reference 1 discloses that a pressing force transmission mechanism 138 to convert rotary motion from the DC motor 114 to reciprocating motion is provided (the configuration of claim 11).

Reference 2 (refer specifically to column 2, line 54 to column 7, line 4 and FIGS. 1 to 3) describes a tapper 10 (corresponding to the reciprocal treatment device) comprising a battery 55 (corresponding to the battery), a motor 22 (corresponding to the motor), a switch 25 (corresponding to the trigger) in electrical communication with the battery 55 and the motor 22 , the switch 25 configured to selectively provide power from the battery 55 to the motor 22 , a striking rod 31 (corresponding to the actuated output) operatively connected to the motor 22 configured to reciprocate in

response to activation of the motor 22 , and a tip 50 (corresponding to the treatment structure) operatively connected to the striking rod 31 .

Reference 2 discloses that the tip 50 is formed from a synthetic rubber or another yielding material . It is deemed that the tip 50 comprises a compliant material (the configuration of claim 2).

Reference 2 discloses that a wheel 76 (corresponding to the linkage) to convert rotary motion from the motor 22 to reciprocating motion is provided (the configuration of claim 11).

Reference 3 (refer specifically to paragraphs [0016] to [0060] and FIGS. 1 to 8) describes a muscle vibrating massage device (corresponding to the reciprocal treatment device) comprising a battery (corresponding to the battery), a motor (200) (corresponding to the motor), a trigger (400) (corresponding to the trigger) in electrical communication with the battery and the motor (200), the trigger (400) configured to selectively provide power from the battery to the motor (200), a slide shaft (321) (corresponding to the actuated output) operatively connected to the motor (200) configured to reciprocate in response to activation of the motor (200), and a vibrator stimulus part (330) (corresponding to the treatment structure) operatively connected to the slide shaft (321).

Reference 3 discloses that the vibrator stimulus part (330) is formed from raw rubber latex or silicone. It is deemed that the vibrator stimulus part (330) comprises a compliant material.

Reference 3 discloses that a vibration rotating part (310) (corresponding to the linkage) to convert motion from the motor (200) to reciprocating motion is provided (the configuration of claim 11).

Thus, there are no differences between the specific features of the inventions according to claims 1, 2, and 11 and the specific features of the inventions described in References 1 to 3.

Further, even if there were a difference between the specific features of the inventions according to claims 1, 2, and 11 and the specific features of the inventions described in References 1 to 3, the inventions according to claims 1, 2, and 11 could have easily been

conceived of by a person skilled in the art based on the inventions described in References 1 to 3 and technical common knowledge at the time of filing of the present application.

· Claim 3
· References 2 and 3
· Remarks
Reference 2 discloses that the tip 50 is formed from a synthetic rubber or another yielding material . Reference 3 discloses that the vibrator stimulus part (330) is formed from raw rubber latex or silicone.

Thus, there are no differences between the specific features of the invention according to claim 3 and the specific features of the inventions disclosed in References 2 and 3.

Further, even if there were a difference between the specific features of the invention according to claim 3 and the specific features of the inventions disclosed in References 2 and 3, a person skilled in the art could have easily conceived of the invention according to claim 3 based on the invention disclosed in References 2 and 3 and technical common knowledge at the time of filing of the present application.

· Claims 9, 10, 18 and 19
· Reference 3
· Remarks
Reference 3 (FIG. 7 (c), (d)) discloses that vibration stimulus part (330) includes a plurality of lobes, and that vibration stimulus part (330) includes two lobes separated by a valley (the configuration of claims 9 and 10).

Reference 3 discloses that an electrical plug (corresponding to the electrical input) is configured as a power supply unit, and a plug type connection is adopted in which the electrical plug is connected to a household socket (the configuration of claims 18 and 19).

Thus, there are no differences between the specific features of the inventions according to claims 9, 10, 18 and 19 and the specific features of the inventions described in Reference 3.

Further, even if there were a difference between the specific features of the inventions according to claims 9, 10, 18 and 19 and the specific features of the inventions described in References 1 to 3, the inventions according to claims 9, 10, 18 and 19 could have easily been conceived of by a person skilled in the art based on the inventions described in

Reference 3 and technical common knowledge at the time of filing of the present application.

Regarding Reason 4 (Inventive step)

· Claims 4 and 8

· References 1 to 6

· Remarks

Reference 2 (FIG. 2) discloses that the tip shape of the tip 50 is hemispherical. Reference 3 (FIGS. 4, 7, 8, etc.) discloses that the tip shape of the vibrator stimulus part (330) is hemispherical.

Reference 4 (refer specifically to paragraphs [0006] to [0009] and FIGS. 1 and 2) discloses an electric massager, wherein a spherical massager is provided at the tip of a holder 2, which reciprocates linearly.

Reference 5 (refer specifically to paragraph [0005] to [0018] and FIGS. 1 to 5) discloses an electric vibration therapy machine, wherein a reciprocating pressing piece 4 has a substantially conical shape. Reference 6 (refer specifically to page 2, lower right column, line 1 to page 3, lower right column, line 18 and FIGS. 1 to 4) discloses a spot-hitting device, wherein a reciprocating ball-end (3) has a spherical body shape, and with reference to FIG. 3(c), it is deemed that Reference 6 also discloses that the ball-end (3) may be substantially conical.

In the technical field of electronic pressing massage devices, how to shape the pressing treatment part is merely a matter of design choice which can be appropriately determined depending on the portion to be pressed and treated. In the inventions disclosed in References 1 to 3, with reference to the above configurations disclosed in References 4 to 6, a person skilled in the art could have easily conceived of configuring the pressing treatment part as recited in claims 4 and 8.

Thus, the inventions according to claims 4 and 8 could have easily been conceived of by a person skilled in the art based on the inventions disclosed in References 1 to 6 and technical common knowledge at the time of filing of the present application.

· Claims 5 to 7

· References 1 to 4 and 6

· Remarks

Reference 6 discloses that the ball-end (3) has a diameter of about 5 mm to 30 mm.

Thus, in the inventions disclosed in References 1 to 3, a person skilled in the art could appropriately optimize the numerical range of the diameter of the pressing treatment part in accordance with the portion to be pressed and treated. Further, with reference to the above configuration of the invention disclosed in Reference 6, selecting the numerical value or a value within the numerical value range of the inventions according to claims 5 to 7 as the value of the diameter is merely the exertion of the ordinary creative abilities of a person skilled in the art. It is not deemed that selecting the numerical value or a value within the numerical value range of the inventions according to claims 5 to 7 would bring about a specifically remarkable effect which could not be anticipated by a person skilled in the art.

Thus, the inventions according to claims 5 to 7 could have easily been conceived of by a person skilled in the art based on the inventions disclosed in References 1 to 4 and 6 and technical common knowledge at the time of filing of the present application.

· Claim 12
· References 1 to 5
· Remarks
Reference 5 discloses that the advance/retreat stroke of the electric vibration therapy machine is 10 mm to 30 mm.

Thus, in the inventions disclosed in References 1 to 3, a person skilled in the art could appropriately optimize the numerical range of the amplitude of the advance/retreat movement of the pressing treatment part in accordance with the portion to be pressed and treated. Further, with reference to the above configuration of the invention disclosed in Reference 5, selecting the numerical value or a value within the numerical value range of the invention according to claims 12 as the value of the amplitude is merely the exertion of the ordinary creative abilities of a person skilled in the art. It is not deemed that selecting the numerical value or a value within the numerical value range of the invention according to claim 12 would bring about a specifically remarkable effect which could not be anticipated by a person skilled in the art.

Thus, the inventions according to claim 12 could have easily been conceived of by a person skilled in the art based on the inventions disclosed in References 1 to 5 and technical common knowledge at the time of filing of the present application.

· Claims 13 and 15
· Reference 1
· Remarks
Reference 1 discloses that in the portable acupressure therapy orthopedic appliance, it is possible to adjust or set the load, strength, and natural frequency to a frequency range selected by the user.

Further, in the invention disclosed in Reference 1, a person skilled in the art could appropriately set the load and strength of the acupressure in accordance with the stroke amount of the distal end piece 166 when setting the load and the strength of the acupressure.

Thus, in the invention disclosed in Reference 1, a person skilled in the art could appropriately optimize the numerical range of the vibration frequency of the tip tool 166 in accordance with the part to be pressed and treated. Selecting the numerical value or a value within the numerical value range of the invention according to claims 15 as the value of the vibration frequency is merely the exertion of the ordinary creative abilities of a person skilled in the art. It is not deemed that selecting the numerical value or a value within the numerical value range of the invention according to claim 15 could bring about a specifically remarkable effect which could not be predicted by a person skilled in the art.

Thus, the inventions according to claims 13 and 15 could have easily been conceived of by a person skilled in the art based on the inventions disclosed in Reference 1 and technical common knowledge at the time of filing of the present application.

· Claims 14 and 16
· References 1 to 3 and 7
· Remarks
In the technical field of equipment in which power is supplied to a motor in response to a trigger switch, a configuration in which a motor is driven in accordance with the amount of activation of a trigger switch and providing a locking function to prohibit the pulling of the trigger switch were well-known technologies at the time of filing of the present application, as disclosed in, for example, Reference 7 (refer to, for example, paragraphs [0032], [0033], and [0058] and FIG. 1).

Thus, in order to improve safety and operability of the trigger switch, it is not deemed that there is any particular difficulty in applying the above well-known technology to the

inventions disclosed in References 1 to 3 to arrive at the configuration of the inventions according to claims 14 and 16.

Thus, the inventions according to claims 14 and 16 could have easily been conceived of by a person skilled in the art based on the inventions disclosed in References 1 to 3, the well-known technology disclosed in Reference 7, and technical common knowledge at the time of filing of the present application.

· Claim 17
· References 1 to 3 and 8
· Remarks
Reference 8 (refer specifically to paragraphs [0018] to [0045] and FIGS. 1 to 4) discloses a massage device 1 in which a main treatment unit 60 and an auxiliary treatment unit 80 move in and out of a head unit 3, wherein the head unit 3 is rotatably connected to a main body 2 by a shaft 4.

Thus, in order to enable reliably press the portion to be pressed and treated, it is not deemed that there is any particular difficulty in applying the above configuration disclosed in Reference 8 to the inventions disclosed in References 1 to 3 to arrive at the configuration of the invention according to claim 17.

Thus, the invention according to claim 17 could have easily been conceived of by a person skilled in the art based on the inventions disclosed in References 1 to 3 and 8 and technical common knowledge at the time of filing of the present application.

LIST OF CITED REFERENCES

1. JP 2010-534110 A
2. US 6228042 B1
3. KR 10-1123926 B1
4. JP 1995(H7)-51393 A
5. JP 3077837 U
6. JP 1990(H2)-19157 A
7. JP 2015-35844 A (cited to indicate well-known technology)
8. JP 2005-204777 A

RECORD OF RESULTS OF PRIOR ART SEARCH

· Technical Field as Examined

IPC A61H 23/02

· Prior art
JP 2013-119018 A
JP 1991(H3)-218763 A

This Record of Results of Prior Art Search does not constitute a reason for rejection.

Note when Making Amendment
(1) It should be noted that portions of the specification and the claims revised in an amendment should be underlined (Formality 13, notes 6 and 7 of the regulations under the Patent Law).

(2) The matters which can be added by amendment are limited to the translation of the description or drawings (limited to any text matter of the drawings) of the international patent application as of the international filing date, the translation of the claims of the international patent application as of the international filing date (in the case where the translation of the amended claims under Article 19 (1) of the Patent Cooperation Treaty has been furnished, such translation), or the drawings of the international patent application as of the international filing date (excluding text matter of the drawings) (hereinafter referred to as translation, etc.) (in the case where the description, claims or drawings were amended by submission of a written correction of incorrect translation, the translation, etc. or such description, claims or drawings as amended). If an amendment is made, please explain the reason why the amendment conforms to the Patent Law, indicating in an argument the portions of the translation, etc. (in the case where the description, claims or drawings were amended by submission of a written correction of incorrect translation, the translation, etc., or such description, claims or drawings as amended) supporting the amendment.

(3) If the claims are amended, please note that the amendment must satisfy Article 17-bis, paragraph 4 of the Patent Law.

If you have any questions regarding the content of this Notice of Reasons for Rejection, or if you wish to arrange an interview in relation to this case, please contact Mr. Mutsumu Kobayashi, in the 2nd Examination Dept., Medical Device Div.
Tel. 03-3581-1101 ext. 3344
Fax. 03-3585-2067

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To: KERRY BROWN
P.O. BOX 446
DRAPER, UT 84020

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Applicant's or agent's file reference 4015-2-003	Date of mailing *(day/month/year)* 01 SEP 2016 **FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/US2016/038326	International filing date *(day/month/year)* 20 June 2016
Applicant THERAGUN, LLC	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   Filing of amendments and statement under Article 19:
   The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

   When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

   How? Directly to the International Bureau of WIPO preferably through ePCT or on paper to, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 82 70

   For more detailed instructions, see *PCT Applicant's Guide*, International Phase, paragraphs 9.004 – 9.011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:
   ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.
   ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

   The applicant may **submit comments on an informal basis on the written opinion of the International Searching Authority** to the International Bureau. These comments will be made available to the public after international publication. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established.

   Shortly after the expiration of **18 months from the priority date, the international application will be published** by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90*bis*.1 and 90*bis*.3).

   Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for **entry into the national phase** before those designated Offices. In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months. For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide*, National Chapters.

   Within **19 months from the priority date, the applicant may request that a supplementary international search be carried out** by a different International Searching Authority that offers this service (Rule 45*bis*.1). The procedure for requesting supplementary international search is described in the *PCT Applicant's Guide*, International Phase, paragraphs 8.006-8.032.

Name and mailing address of the ISA/ Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, VA 22313-1450 Facsimile No. 571-273-8300	Authorized officer Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 Telephone No. PCT OSP: 571-272-7774

Form PCT/ISA/220 (July 2014)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 4015-2-003	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US2016/038326	International filing date *(day/month/year)* 20 June 2016	(Earliest) Priority Date *(day/month/year)* 20 June 2015
Applicant THERAGUN, LLC		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 2 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**
   a. With regard to the language, the international search was carried out on the basis of:
      ☒ the international application in the language in which it was filed.
      ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).
   b. ☐ This international search report has been established taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).
   c. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, see Box No. I.

2. ☐ Certain claims were found unsearchable (see Box No. II).

3. ☐ Unity of invention is lacking (see Box No. III).

4. With regard to the title,
   ☒ the text is approved as submitted by the applicant.
   ☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,
   ☒ the text is approved as submitted by the applicant.
   ☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the drawings,
   a. the figure of the drawings to be published with the abstract is Figure No. 1
      ☒ as suggested by the applicant.
      ☐ as selected by this Authority, because the applicant failed to suggest a figure.
      ☐ as selected by this Authority, because this figure better characterizes the invention.
   b. ☐ none of the figures is to be published with the abstract.

Form PCT/ISA/210 (first sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2016/038326

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - A61H 23/02; A61H 23/04; A61H 39/04 (2016.01)
CPC - A61H 23/0254; A61H 23/02; A61H 23/0218; A61H 2201/1669 (2016.08)
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 - A61H 23/02; A61H 23/04; A61H 39/04
CPC - A61H 23/02; A61H 23/0218; A61H 23/0254; A61H 2201/1669

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC - 601/97; 601/99; 601/101; 601/112 (keyword delimited)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Patbase, Google Patents, Google, Google Scholar.
Search terms used: reciprocate, oscillate, treatment, battery, motor, trigger, lock, lobes, amplitude, angle.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,228,042 B1 (DUNGAN) 08 May 2001 (08.05.2001) entire document	1-8, 11, 13, 14, 18-20
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Y		9, 10, 12, 15-17
Y	US 2014/0180331 A1 (TURNER) 26 June 2014 (26.06.2014) entire document	9, 10
Y	US 4,173,217 A (JOHNSTON) 06 November 1979 (06.11.1979) entire document	12
Y	WO 2014/118596 A1 (TELEFIELD LIMITED) 07 August 2014 (07.08.2014) entire document	15
Y	US 2008/0103419 A1 (ADAMSON) 01 May 2008 (01.05.2008) entire document	16
Y	US 2003/0195443 A1 (MILLER) 16 October 2003 (16.10.2003) entire document	17
A	US 5,569,168 A (HARTWIG) 29 October 1996 (29.10.1996) entire document	1-20
A	US 6,663,657 B1 (MILLER) 16 December 2003 (16.12.2003) entire document	1-20
A	US 4,549,535 A (WING) 29 October 1985 (29.10.1985) entire document	1-20

☐ 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
12 August 2016	01 SEP 2016
Name and mailing address of the ISA/ Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, VA 22313-1450 Facsimile No. 571-273-8300	Authorized officer Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (January 2015)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: KERRY BROWN
P.O. BOX 446
DRAPER, UT 84020

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	01 SEP 2016
Applicant's or agent's file reference 4015-2-003	FOR FURTHER ACTION See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2016/038326	20 June 2016	20 June 2015

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - A61H 23/02; A61H 23/04; A61H 39/04 (2016.01)
CPC - A61H 23/0254; A61H 23/02; A61H 23/0218; A61H 2201/1669 (2016.08)

Applicant THERAGUN, LLC

1. 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 under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/	Date of completion of this opinion	Authorized officer
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, VA 22313-1450 Facsimile No. 571-273-8300	12 August 2016	Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (January 2015)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2016/038326

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:
   - [X] the international application in the language in which it was filed.
   - [ ] a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. [ ] This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a)).

3. [ ] With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:
   - a. [ ] forming part of the international application as filed:
     - [ ] in the form of an Annex C/ST.25 text file.
     - [ ] on paper or in the form of an image file.
   - b. [ ] furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
   - c. [ ] furnished subsequent to the international filing date for the purposes of international search only:
     - [ ] in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).
     - [ ] on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. [ ] In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

Form PCT/ISA/237 (Box No. I) (January 2015)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2016/038326

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	5-10, 12, 15-17	YES
	Claims	1-4, 11, 13, 14, 18-20	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-20	NO
Industrial applicability (IA)	Claims	1-20	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1-4, 11, 13, 14, and 18-20 lack novelty under PCT Article 33(2) as being anticipated by Dungan.

Regarding Claim 1, Dungan discloses a reciprocal treatment device (10, Fig. 2; Abstract, regarding "A chiropractic adjustment tool or tapper comprises a housing, the housing having an open end; a striker assembly disposed within the housing .... striker assembly comprises a reciprocating striking rod") comprising: a battery (55; Col. 3, Lns. 25-32, regarding "The power source 22 and source of energy 23 may be of any convenient form, such as a pneumatic motor operatively connected to ... an electric motor operatively connected to a battery 55"); a motor (Col. 3, Lns. 25-32, regarding "an electric motor operatively connected to a battery 55"); a trigger (25) in electrical communication with the battery and the motor (Col. 4, Lns. 36-44, regarding "The power source 22 is operatively connected to means 24 for controlling the flow of power ... such as a switch 25 or the like ... The switch 25 may be in any well-known form, including a "trigger"..."), the trigger configured to selectively provide power from the battery to the motor (Col. 4, Lns. 36-44, regarding "such as a switch 25 or the like, in the well-known manner to enable a user to control the operation of the device by regulating the flow of power from the power source"); an actuated output (31; Col. 3, Lns. 45-46, regarding "reciprocating striking rod 31") operatively connected to the motor configured to reciprocate in response to activation of the motor (Col. 3, Lns. 45-57, regarding "The striker assembly 26 further comprises a reciprocating striking rod 31 ... The striking rod 31 is, preferably, made of a metal for durability. The power source 22 provides power to propel the striking rod 31 forward and backward"); and a treatment structure (50 and 52; Col. 6, Lns. 10-16) operatively connected to the actuated output (As in Fig. 2; Col. 6, Lns. 10-16, regarding "A tip 50 is mounted atop the plunging rod 36 ... The tip 50 is formed, preferably, of synthetic rubber or another yielding material. A removable, disposable second tip 52 may be used with the device 10. Where used, the second tip 52 envelops the tip 50, to provide a hygienic surface for contact with a person to be treated by the tapper 10"; Col. 5, Ln. 67 thru Col. 6, Ln. 3, regarding "The plunging rod 36 percussively contacts a patient being treated by the tapper 10, using power from the power source 22 as delivered by the striking rod 31").

Regarding Claim 2, Dungan discloses the reciprocal treatment device of claim 1, wherein the treatment structure (50 and 52) comprises a compliant material (Col. 6, Lns. 10-16, regarding "A tip 50 is mounted atop the plunging rod 36 ... The tip 50 is formed, preferably, of synthetic rubber or another yielding material. A removable, disposable second tip 52 may be used with the device 10. Where used, the second tip 52 envelops the tip 50, to provide a hygienic surface for contact with a person to be treated by the tapper 10").

Regarding Claim 3, Dungan discloses the reciprocal treatment device of claim 1, wherein the treatment structure (50 and 52) comprises a polymer (Col. 6, Lns. 10-16, regarding "A tip 50 is mounted atop the plunging rod 36 ... The tip 50 is formed, preferably, of synthetic rubber or another yielding material. A removable, disposable second tip 52 may be used with the device 10. Where used, the second tip 52 envelops the tip 50, to provide a hygienic surface for contact with a person to be treated by the tapper 10"; synthetic rubber is a form of polymer).

Regarding Claim 4, Dungan discloses the reciprocal treatment device of claim 1, wherein the treatment structure (52) has a substantially spherical shape (As in Fig. 2, 52 at 40 is spherical).

Regarding Claim 11, Dungan discloses the reciprocal treatment device of claim 1, further comprising a linkage to convert rotary motion from the motor to reciprocating motion (Col. 4, Lns. 45-65, regarding the "When the power source 22 is engaged via the means for controlling 24, the first connecting rod 63 causes the first gear 66 to rotate. The motion of the first gear 66 causes the second gear 68, with which the first gear 66 is meshingly engaged, to rotate. The motion of the second gear 68 causes the shaft 74, with which the second gear 68 is integrally formed, to rotate. The rotation of the shaft 74 causes the wheel 76, which is securedly mounted on the shaft 74, to rotate. The motion of the wheel 76, which, as described hereinabove, alternatively tilts towards and away from the shaft 74 and and delete, "which which is interrnittently contacted by the wheel 76 at the point 77 thereof to reciprocally move"; causes the striking rod 31, which is intermittently contacted by the wheel 76 at the point 77 thereof to reciprocally move to move away from the shaft").

Regarding Claim 13, Dungan discloses the reciprocal treatment device of claim 1, wherein the reciprocating motion of the actuated output has a user-adjustable amplitude (Col. 4, Lns. 36-44, regarding "The power source 22 is operatively connected to means 24 for controlling the flow of power ... such as a switch 25 or the like, in the well-known manner to enable a user to control the operation of the device by regulating the flow of power from the power source. The switch 25 may be in any well-known form, including a "trigger"..."; Col. 3, Lns. 45-57, regarding "The striker assembly 26 further comprises a reciprocating striking rod 31 ... The striking rod 31 is, preferably, made of a metal for durability. The power source 22 provides power to propel the striking rod 31 forward and backward"; reciprocation has inbuilt amplitude).

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2016/038326

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:

Regarding Claim 14, Dungan discloses the reciprocal treatment device of claim 1, wherein the trigger (25) is a variable trigger that selectively adjusts a rate of the reciprocating motion in response to an amount of activation of the trigger (Col. 4, Lns. 36-44, regarding "The power source 22 is operatively connected to means 24 for controlling the flow of power ... such as a switch 25 or the like, in the well-known manner to enable a user to control the operation of the device by regulating the flow of power from the power source. The switch 25 may be in any well-known form, including a "trigger"..."; Col. 3, Lns. 45-57, regarding "The striker assembly 26 further comprises a reciprocating striking rod 31 ... The striking rod 31 is, preferably, made of a metal for durability. The power source 22 provides power to propel the striking rod 31 forward and backward").

Regarding Claim 18, Dungan discloses a reciprocal treatment device (10, Fig. 2; Abstract, regarding "A chiropractic adjustment tool or tapper comprises a housing, the housing having an open end; a striker assembly disposed within the housing .... striker assembly comprises a reciprocating striking rod") comprising: an electrical input (Col. 3, Lns. 25-32, regarding "The power source 22 and source of energy 23 may be of any convenient form, such as a pneumatic motor operatively connected to ... an electric motor operatively connected to a battery 55, or an electric motor operatively connected to a wall outlet, etc."); a motor (Col. 3, Lns. 25-32, regarding "The power source 22 and source of energy 23 may be of any convenient form, such as a pneumatic motor operatively connected to ... an electric motor operatively connected to a battery 55, or an electric motor operatively connected to a wall outlet, etc."); a trigger (25) in electrical communication with the electrical input and the motor (Col. 4, Lns. 36-44, regarding "The power source 22 is operatively connected to means 24 for controlling the flow of power ... such as a switch 25 or the like, in the well-known manner to enable a user to control the operation of the device by regulating the flow of power from the power source. The switch 25 may be in any well-known form, including a "trigger"..."), the trigger configured to selectively provide power from the electrical input to the motor (Col. 4, Lns. 36-44, regarding "The power source 22 is operatively connected to means 24 for controlling the flow of power ... such as a switch 25 or the like, in the well-known manner to enable a user to control the operation of the device by regulating the flow of power from the power source. The switch 25 may be in any well-known form, including a "trigger"..."); an actuated output (31; Col. 3, Lns. 45-46, regarding "reciprocating striking rod 31") operatively connected to the motor configured to reciprocate in response to activation of the motor (Col. 3, Lns. 45-57, regarding "The striker assembly 26 further comprises a reciprocating striking rod 31 ... The striking rod 31 is, preferably, made of a metal for durability. The power source 22 provides power to propel the striking rod 31 forward and backward"); and a treatment structure (50 and 52; Col. 6, Lns. 10-16) operatively connected to the actuated output (As in Fig. 2; Col. 6, Lns. 10-16, regarding "A tip 50 is mounted atop the plunging rod 36 ... The tip 50 is formed, preferably, of synthetic rubber or another yielding material. A removable, disposable second tip 52 may be used with the device 10. Where used, the second tip 52 envelops the tip 50, to provide a hygienic surface for contact with a person to be treated by the tapper 10"; Col. 5, Ln. 67 thru Col. 6, Ln. 3, regarding "The plunging rod 36 percussively contacts a patient being treated by the tapper 10, using power from the power source 22 as delivered by the striking rod 31").

Regarding Claim 19, Dungan discloses the reciprocal treatment device of claim 18, wherein the electrical input comprises a plug for connection to a household socket (Col. 3, Lns. 25-32, regarding "The power source 22 and source of energy 23 may be of any convenient form, such as a pneumatic motor operatively connected to ... an electric motor operatively connected to a battery 55, or an electric motor operatively connected to a wall outlet, etc.").

Regarding Claim 20, Dungan discloses a reciprocal treatment device (10, Fig. 2; Abstract, regarding "A chiropractic adjustment tool or tapper comprises a housing, the housing having an open end; a striker assembly disposed within the housing .... striker assembly comprises a reciprocating striking rod") comprising: a battery (55; Col. 3, Lns. 25-32, regarding "The power source 22 and source of energy 23 may be of any convenient form, such as a pneumatic motor operatively connected to ... an electric motor operatively connected to a battery 55"); a motor (Col. 3, Lns. 25-32, regarding "an electric motor operatively connected to a battery 55"); a variable trigger (25) in electrical communication with the battery and the motor, the trigger configured to selectively provide power from the battery to the motor (Col. 4, Lns. 36-44, regarding "The power source 22 is operatively connected to means 24 for controlling the flow of power ... such as a switch 25 or the like, in the well-known manner to enable a user to control the operation of the device by regulating the flow of power from the power source. The switch 25 may be in any well-known form, including a "trigger"...") and to selectively vary a rate of reciprocation (Col. 4, Lns. 36-44, regarding "The power source 22 is operatively connected to means 24 for controlling the flow of power ... such as a switch 25 or the like, in the well-known manner to enable a user to control the operation of the device by regulating the flow of power from the power source. The switch 25 may be in any well-known form, including a "trigger"..."); an actuated output (31; Col. 3, Lns. 45-46, regarding "reciprocating striking rod 31") operatively connected to the motor configured to reciprocate in response to activation of the motor (Col. 3, Lns. 45-57, regarding "The striker assembly 26 further comprises a reciprocating striking rod 31 ... The striking rod 31 is, preferably, made of a metal for durability. The power source 22 provides power to propel the striking rod 31 forward and backward"); and a treatment structure (50 and 52; Col. 6, Lns. 10-16) comprising a compliant material operatively connected to the actuated output (As in Fig. 2; Col. 6, Lns. 10-16, regarding "A tip 50 is mounted atop the plunging rod 36 ... The tip 50 is formed, preferably, of synthetic rubber or another yielding material. A removable, disposable second tip 52 may be used with the device 10. Where used, the second tip 52 envelops the tip 50, to provide a hygienic surface for contact with a person to be treated by the tapper 10"; Col. 5, Ln. 67 thru Col. 6, Ln. 3, regarding "The plunging rod 36 percussively contacts a patient being treated by the tapper 10, using power from the power source 22 as delivered by the striking rod 31").

Claims 5-8 lack an inventive step under PCT Article 33(3) as being obvious over Dungan.

Regarding Claim 5, Dungan discloses the reciprocal treatment device of claim 4, wherein the treatment structure (52) has a diameter (As in Fig. 2, 52 at 40 is spherical and has a diameter).
Dungan fails to explicitly disclose said diameter is between one half inch and three inches.
However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have said diameter to be between one half inch and three inches, since where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. The motivation for doing so would be to optimize the amount force that is being delivered to the patient being treated.

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2016/038326

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:

Regarding Claim 6, Dungan discloses the reciprocal treatment device of claim 4, wherein the treatment structure (52) has a diameter (As in Fig. 2, 52 at 40 is spherical and has a diameter).
Dungan fails to explicitly disclose said diameter of one and one half inches.
However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have said diameter to be between one and one half inches, since where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. The motivation for doing so would be to optimize the amount force that is being delivered to the patient being treated.

Regarding Claim 7,Dungan discloses the reciprocal treatment device of claim 4, wherein the treatment structure (52) has a diameter (As in Fig. 2, 52 at 40 is spherical and has a diameter).
Dungan fails to explicitly disclose said diameter of one half inch.
However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have said diameter to be one half inch, since where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. The motivation for doing so would be to optimize the amount force that is being delivered to the patient being treated.

Regarding Claim 8, Dungan discloses the reciprocal treatment device of claim 1, wherein the treatment structure (50 and 52) has a substantially cylindrical shape and a rounded distal end (Shape of 50 and 52 in Fig. 2).
Dungan fails to explicitly disclose a substantially conical shape and a rounded distal end.
However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the cylindrical shape with a substantially conical shape, since a change in shape of an element involves only routine skill in the art. The motivation for doing so would be reduce the amount of material being used at the tip.

Claims 9 and 10 lack an inventive step under PCT Article 33(3) as being obvious over Dungan in view of Turner.

Regarding Claim 9, Dungan discloses the reciprocal treatment device of claim 1, but fails to explicitly disclose wherein the treatment structure comprises a plurality of lobes.
Turner is in the field of nueromuscular therapy device and method (Title) and teaches a treatment structure comprises a plurality of lobes (Fig. 5b, structure with lobes 139; Para. [0046]).
It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the treatment devices of Dungan with the bi-lobed unit of Turner for the purpose of providing anatomical pressure and relief from aches and pains (Para. [0046] of Turner).

Regarding Claim 10, modified Dungan discloses the reciprocal treatment device of claim 9, but Dungan fails to explicitly disclose wherein the treatment structure comprises two lobes separated by a valley.
Turner is in the field of nueromuscular therapy device and method (Title) and teaches wherein the treatment structure comprises two lobes separated by a valley (Fig. 5b, structure with lobes 139 separated by valley 138; Para. [0046]).
It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the treatment devices of Dungan with the bi-lobed unit of Turner for the purpose of providing anatomical pressure and relief from aches and pains (Para. [0046] of Turner).

Claim 12 lacks an inventive step under PCT Article 33(3) as being obvious over Dungan in view of Johnston.

Regarding Claim 12, Dungan discloses the reciprocal treatment device of claim 1, wherein the reciprocating motion of the actuated output has an amplitude (Col. 4, Lns. 36-44, regarding "The power source 22 is operatively connected to means 24 for controlling the flow of power ... such as a switch 25 or the like, in the well-known manner to enable a user to control the operation of the device by regulating the flow of power from the power source. The switch 25 may be in any well-known form, including a "trigger..."; Col. 3, Lns. 45-57, regarding "The striker assembly 26 further comprises a reciprocating striking rod 31 ... The striking rod 31 is, preferably, made of a metal for durability. The power source 22 provides power to propel the striking rod 31 forward and backward"; reciprocation has inbuilt amplitude).
Dungan fails to explicitly disclose wherein the reciprocating motion of the actuated output has an amplitude between one inch and one quarter inch.
Johnston is in the field of massage apparatus (Title) and teaches wherein a reciprocating motion of an actuated output has an amplitude between one inch and one quarter inch (Col. 2, Lns. 36-43, regarding "reciprocating massage elements 146 extending therefrom, each element having an amplitude of between 1/2 to 1....").
It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the reciprocating amplitude of Dungan with the operating amplitude of Johnston for the purpose of treating deep muscles (Col. 2, Lns. 36-43 of Johnston).

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2016/038326

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:

Claim 15 lacks an inventive step under PCT Article 33(3) as being obvious over Dungan in view of Telefield Limited.

Regarding Claim 15, Dungan discloses the reciprocal treatment device of claim 1, wherein a rate of the reciprocating motion (Col. 4, Lns. 36-44, regarding "The power source 22 is operatively connected to means 24 for controlling the flow of power ... such as a switch 25 or the like, in the well-known manner to enable a user to control the operation of the device by regulating the flow of power from the power source. The switch 25 may be in any well-known form, including a "trigger"..."; Col. 3, Lns. 45-57, regarding "The striker assembly 26 further comprises a reciprocating striking rod 31 ... The striking rod 31 is, preferably, made of a metal for durability. The power source 22 provides power to propel the striking rod 31 forward and backward"; reciprocation rate can be controlled with control of power).
Dungan fails to explicitly disclose a rate of the reciprocating motion is between 30 Hz and 80 Hz.
Telefield Limited is in the field of facial care apparatus (Title) and teaches a rate of the reciprocating motion is between 30 Hz and 80 Hz (Para. [0015], regarding "the first reciprocating motion is a padding or tapping motion"; Para. [0017], regarding "The frequency of the padding motion may be less than 100 Hz, or less than 80Hz, or less than 60Hz").
It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the rate of reciprocation of Dungan with the rate of Telefield Limited for the purpose of treating facial areas of a user (Para. [0038] of Telefield Limited).

Claim 16 lacks an inventive step under PCT Article 33(3) as being obvious over Dungan in view of Adamson.

Regarding Claim 16, Dungan discloses the reciprocal treatment device of claim 1, but fails to explicitly disclose further comprising a trigger lock to restrict movement of the trigger.
Adamson is in the field of apparatus for applying reciprocating force (Abstract) and teaches a trigger lock to restrict movement of a trigger (Fig. 4, Para. [0045], clamp 80 locking trigger 70).
It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the trigger of Dungan with the locking clamp of Adamson for the purpose of applying a sustained force over required periods of time.

Claim 17 lacks an inventive step under PCT Article 33(3) as being obvious over Dungan in view of US 2003/0195443 A1 to Miller (hereinafter Miller).

Regarding Claim 17, Dungan discloses the reciprocal treatment device of claim 1, but fails to explicitly disclose wherein an angle of the actuated output relative to other components of the reciprocal treatment device is adjustable.
Miller is in the field of percussive therapeutic device (Title) and teaches an angle of an actuated output relative to other components of a reciprocal treatment device is adjustable (Para. [0026], regarding "The coupler 62 is used for affixing impact heads 70 of varying shapes. In the preferred embodiment the coupler 62 is formed so as to permit the impact head 70 to be removably affixed to the reciprocating rod 16 at a set, but adjustable angle"; Abstract, regarding tool having reciprocating rod).
It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the output component of Dungan with the angle adjustment means of Miller for the purpose of contacting the person being treated at any of a range of rates, travels and force levels (Para. [0027] of Miller).

Claims 1-20 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To: Brennan C. Swain, Esq.
Jeffer Mangels Butler & Mitchell LLP
1900 Avenue of the Stars, 7th Floor
Los Angeles, California 90067
United States of America

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Applicant's or agent's file reference 76840-7010	Date of mailing *(day/month/year)* 31 MAY 2018 **FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/US18/22426	International filing date *(day/month/year)* 14 March 2018 (14.03.2018)
Applicant THERAGUN, LLC	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   Filing of amendments and statement under Article 19:
   The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

   When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

   How? Directly to the International Bureau of WIPO preferably through ePCT or on paper to, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 82 70

   For more detailed instructions, see *PCT Applicant's Guide*, International Phase, paragraphs 9.004 – 9.011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:
   ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.
   ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

   The applicant may **submit comments on an informal basis on the written opinion of the International Searching Authority** to the International Bureau. These comments will be made available to the public after international publication. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established.

   Shortly after the expiration of **18 months from the priority date, the international application will be published** by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90*bis*.1 and 90*bis*.3).

   Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for **entry into the national phase** before those designated Offices. In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months. For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide*, National Chapters.

   Within **22 months from the priority date, the applicant may request that a supplementary international search be carried** out by a different International Searching Authority that offers this service (Rule 45*bis*.1). The procedure for requesting supplementary international search is described in the *PCT Applicant's Guide*, International Phase, paragraphs 8.006-8.032.

Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	Authorized officer Shane Thomas PCT Helpdesk: 571-272-4300 Telephone No. PCT OSP: 571-272-7774

Form PCT/ISA/220 (July 2017)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 76840-7010	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US18/22426	International filing date *(day/month/year)* 14 March 2018 (14.03.2018)	(Earliest) Priority Date *(day/month/year)* 14 March 2017 (14.03.2017)
Applicant THERAGUN, LLC		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 9 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of:

☒ the international application in the language in which it was filed.

☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).

c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (see Box No. II).

3. ☐ **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. 7

☒ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

b. ☐ none of the figures is to be published with the abstract.

Form PCT/ISA/210 (first sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US18/22426

A. CLASSIFICATION OF SUBJECT MATTER

IPC - A61H 1/00, 7/00, 9/00, 11/00, 11/02, 23/00, 23/02 (2018.01)

CPC - A61H 1/00, 7/00, 9/00, 11/00, 11/02, 23/00, 23/02

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)
See Search History document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
See Search History document

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 5,951,501 A (GRINER, T) 14 September 1999; Figures 2, 3, 7, 10, 11, column 2 line 35 to column 4 line 2	9, 13 --- 1-6, 9-12
Y	US 8,951,216 B2 (YOO, C et al.) 10 February 2015; Figures 1, 2, 5, column 3, lines 35-45	1-6, 9-12
Y	US 4,730,605 A (NOBLE, E et al.) 15 March 1988; Figure 4, column 3 lines 22-31	5, 12
Y	US 5,417,644 A (LEE, M et al.) 23 May 1995; Figures 3A, 3B, column 2 lines 60-68	6
A	US 5,085,207 A (FIORE, R) 4 February 1992; Figure 4	1-13
A	US 4,150,668 A (JOHNSTON, L) 24 April 1979; Figure 2	1-13
A	US 4,566,442 A (MABUCHI, K et al.) 28 January 1986; Figure 1	1-13

☐ 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
16 May 2018 (16.05.2018)	31 MAY 2018
Name and mailing address of the ISA/ Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	Authorized officer Shane Thomas PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (January 2015)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: Brennan C. Swain, Esq.
Jeffer Mangels Butler & Mitchell LLP
1900 Avenue of the Stars, 7th Floor
Los Angeles, California 90067
United States of America

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	31 MAY 2018
Applicant's or agent's file reference 76840-7010	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US18/22426	14 March 2018 (14.03.2018)	14 March 2017 (14.03.2017)

International Patent Classification (IPC) or both national classification and IPC
IPC - A61H 1/00, 7/00, 9/00, 11/00, 11/02, 23/00, 23/02 (01.2018)
CPC - A61H 1/00, 7/00, 9/00, 11/00, 11/02, 23/00, 23/02

Applicant THERAGUN, LLC

1. 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 under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/US	Date of completion of this opinion	Authorized officer
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	16 May 2018 (16.05.2018)	Shane Thomas PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (January 2015)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
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Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a)).

3. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:

   a. ☐ forming part of the international application as filed:

      ☐ in the form of an Annex C/ST.25 text file.

      ☐ on paper or in the form of an image file.

   b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

   c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

      ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

      ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

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Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	1-8, 10-12	YES
	Claims	9, 13	NO
Inventive step (IS)	Claims	7, 8	YES
	Claims	1-6, 9-13	NO
Industrial applicability (IA)	Claims	1-13	YES
	Claims	NONE	NO

2. Citations and explanations:

Claims 9, 13 lack novelty under PCT Article 33(2) as being anticipated by Griner.

As per claim 9, Griner discloses a reciprocating treatment device (device 10 massages the user's muscles; Figure 1, column 2 lines 30-35) comprising: a housing (outer housing 11; Figure 2, column 2 lines 35-37), a handle disposed on the housing (handle 18; Figure 2, column 2 lines 40-45), the handle having a handle axis (handle 18 has an axis that runs in line with the length of the housing 11; Figure 2, column 2 lines 40-45), a motor disposed in the housing (motor 23 is powered within housing 11; Figures 2, 3, column 2 lines 47-51), and an actuated output operably connected to the motor (motor 23 is coupled to a drive pulley 25, which drives a belt 26 that has a ramp 28 connected to it which interacts with plunger body 37; Figure 3, column 2 line 55 to column 3 line 27), the actuated output configured to reciprocate in response to activation of the motor (ramp 28 interacts with plunger body 37 and causes tip 47 to move back and forth in a linear manner; Figure 3, column 2 line 55 to column 3 line 27), wherein reciprocation is along a reciprocation axis (the reciprocation occurs in an axis that is collinear to the shaft of plunger body 37; Figure 3 , column 3 lines 22-28), wherein the motor comprises a shaft having a shaft rotation axis (motor 23 drives a motor shaft 24 with an axis collinear to the motor shaft 24; Figure 3, column 2 lines 54-56), and wherein the shaft rotation axis lies in a plane defined by the handle axis and the reciprocation axis (the shaft rotation axis lies in a plane defined by the axes formed by the handle 18 and the plunger body 37 because the motor shaft 24 is in line with both in handle 18 and the plunger body 37 as seen in figure 3).

As per claim 13, Griner discloses the reciprocating treatment device of claim 9 wherein the actuated output is selectively rotatable relative to the housing around an output rotation axis (threaded socket 44 allows threaded rod 45 to be rotated relative to housing 11 with an axis collinear to plunger body 37; Figure 3, column 3 lines 10-15).

Claims 1-4, 9-11 lack an inventive step under PCT Article 33(3) as being obvious over US 8,951,216 B2 to Yoo et al., hereinafter "Yoo" in view of US 5,951,501 A to Griner T, hereinafter "Griner".

As per claim 1, Yoo discloses a massage device comprising, a housing (first case 10 is where the battery pack, motor 13, and an actuating unit 15 are installed; Figure 1, column 3 lines 35-43), an electrical input (batteries 100 are inside the battery receiving unit 11: Figure 1, column 3 lines 38-41), a motor (driving motor 13 is installed in the first case 10; Figure 1, column 3 lines 40-43), an actuated output operatively connected to the motor and configured to reciprocate in response to activation of the motor (an actuating unit 15 is operated by the driving motor 13; Figure 1, column 3 lines 40-44), a switch in electrical communication with the electrical input and the motor (rotary switch 12 is integrated into the battery receiving unit 11; Figure 2, column 3 lines 47-51), the switch configured to selectively provide power from the electrical input to the motor (rotary switch 12 is configured to supply the electricity from the batteries 100 to the driving motor 13; Figure 2, column 3 lines 47-51), and a treatment structure operatively connected to a distal end of the actuated output (a plurality of stimulus bosses 22a are installed on the end of a tapping head 22; Figure 1, column 4 lines 17-21). Yoo does not disclose wherein the actuated output is configured to reciprocate the treatment structure at a frequency of between about 15 Hz and about 100 Hz, and at an amplitude of between about 0.15 and about 1.0 inches, and wherein the combination of amplitude and frequency provides efficient reciprocation of the treatment structure such that the treatment structure provides therapeutically beneficial treatment to a targeted muscle of a user. Griner discloses wherein the actuated output is configured to reciprocate the treatment structure at a frequency of between about 15 Hz and about 100 Hz (the plunger pulsates 15 times per second; Claim 10), and at an amplitude of between about 0.15 and about 1.0 inches (ramp 28, which causes the plunger body 37 to reciprocate, determines the length of the stroke by its height, 0.280 in.; Figure 7, column 3 lines 35-38), and wherein the combination of amplitude and frequency provides efficient reciprocation of the treatment structure such that the treatment structure provides therapeutically beneficial treatment to a targeted muscle of a user (producing a 0.0705 second dwell time (c) and a 0.0075 second pulse duration (d) yields a greater depth of muscle stimulation; Figures 10, 11, column 3 line 65 to column 4 line 2). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Yoo to include a frequency of 15 Hz to 100 Hz and an amplitude between 0.15 and 1.0 inches because, as Griner teaches, those ranges of both frequency and amplitude yield a more effective massaging experience for the user.

-***-Continued Within the Next Supplemental Box-***-

WRITTEN OPINION OF THE
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Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

Claim 1 is objected to under PCT Rule 66.2(a)(iii) as containing the following defect in the form or contents thereof: Claim 1 has a typographical error in the form of a extra comma.

Form PCT/ISA/237 (Box No. VII) (January 2015)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:

-***-Continued from Box V: Citations and Explanations-***-
As per claim 2, Yoo in view of Griner discloses the massage device of claim 1, and Yoo further discloses wherein the motor is configured to rotate a shaft having a shaft gear thereon about a shaft rotation axis (bevel gear 16d is driven by driving member 16 along the shaft's axis; Figure 5, column 5 lines 51-54), wherein the housing includes a gear member disposed therein that is operatively engaged with the shaft gear and rotates about a gear rotation axis (driven bevel gear 16e is driven by the driving bevel gear 16d and rotates on the axis on the shaft it is connected to; Figure 5, column 5 lines 53-56), wherein the actuated output is operatively connected to the gear member (cam 16f is installed on the same shaft as driven bevel gear 16e; Figure 5, column 5 lines 56-59), and wherein rotational motion of the shaft is converted to reciprocating motion of the actuated output through the engagement of the shaft gear and the gear member (cam 16f operates so that it moves driven member 17 in a reciprocating linear manner; Figure 5, column 5 lines 58-61).

As per claim 3, Yoo in view of Griner discloses the massage device of claim 2 and Yoo further discloses wherein the gear rotation axis is perpendicular to the shaft rotation axis (driven bevel gear 16e is perpendicular to driving bevel gear 16f; Figure 5, column 5 lines 51-56), wherein an eccentric interface is disposed on the gear member at a location other than the gear rotation axis (cam 16f is attached to the shaft that is driven by the driven bevel gear 16e and has a crank rod 18 attached to it that is not attached at the gear rotation axis; Figure 5, column 5 lines 56-59 column 6 lines 20-25).

As per claim 4, Yoo in view of Griner discloses the massage device of claim 3 and Yoo further discloses further comprising a reciprocator shaft operatively connected to the eccentric interface (crank rod 18 is attached to cam 16f; Figure 5 column 6 lines 20-25), and a containment member (second case 20 restricts the motion of tapping member 21 into a linear manner; Figures 2, 5; column 4 lines 15-25), wherein a head of the reciprocator shaft is contained by the containment member to restrict motion of the reciprocator shaft to a linear motion that is perpendicular to the gear rotation axis (tapping member 21 (head of reciprocator shaft) barely fits within the second case 20 in order to eliminate nonlinear motion; Figure 2, column 4 lines 10-15).

As per claim 9, Yoo discloses a reciprocating treatment device comprising: a housing (first case 10 acts as a housing; Figure 1 column 3 lines 38-40), a motor disposed in the housing (driving motor 13 is installed in first case 10; Figure 1; column 3 lines 40-42), and an actuated output operably connected to the motor (actuating unit 15 is operated by driving motor 13; Figure 1, column 3 lines 40-42), the actuated output configured to reciprocate in response to activation of the motor (driving member 16 rotates driving gear 16d which interacts and rotates driven gear 16e, of which cam 16f is attached to moving crank rod 18 tapping member 21 to reciprocate; Figure 5, column 6 lines 5-25), wherein reciprocation is along a reciprocation axis (connecting rod 21b moves linearly in an up and down motion, in the perspective of figure 5; As seen in figure 5), wherein the motor comprises a shaft having a shaft rotation axis (the driving member has a rotational axis that is collinear to the movement of connecting rod 21b; As seen in figure 5). Yoo does not disclose a handle disposed on the housing, the handle having a handle axis. Griner discloses a handle disposed on the housing (outer housing 11; Figure 2, column 2 lines 35-37), the handle having a handle axis (handle 18 has an axis that runs in line with the length of the housing 11; Figure 2, column 2 lines 40-45), and wherein the shaft rotation axis lies in a plane defined by the handle axis and the reciprocation axis (the shaft rotation axis lies in a plane defined by the axes formed by the handle 18 and the plunger body 37 because the motor shaft 24 is in line with both in handle 18 and the plunger body 37; As seen in figure 3). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Yoo to include a handle in the same plane as the reciprocating axis and the shaft axis because, as Griner teaches, it allows the user to grasp the device and have more control with the device while it is in use.

As per claim 10, Yoo in view of Griner discloses the reciprocating treatment device of claim 9, and Yoo further discloses a device further comprising a gearbox to convert rotary motion from the shaft to reciprocal motion at the actuated output (driving gear 16d interacts with and rotates driven gear 16e which interacts with and reciprocates tapping member 21; Figures 3-6, column 4 lines 35-45).

As per claim 11, Yoo in view of Griner discloses the reciprocating treatment device of claim 10, and Yoo further discloses wherein the gearbox comprises: a gear member comprising: a gear rotation axis perpendicular to the shaft rotation axis (driven bevel gear 16e is perpendicular to the shaft rotational axis of the motor 13; Figure 5, column 6 lines 5-15), and an eccentric interface disposed on the gear member at a location other than the gear rotation axis (cam 16f is connected to the driven bevel gear 16e and has a crank rod 18 attached to it not at the gear rotation axis; Figure 5, column 6 lines 10-25), a reciprocator shaft operatively connected to the eccentric interface (crank rod 18 is attached to cam 16f; Figure 5, column 6 lines 20-25), and a reciprocator interface configured to restrict linear motion of the reciprocator shaft to a direction parallel to the reciprocation axis and perpendicular to the gear rotation axis (second case 20 restricts the motion of tapping member 21 into a linear manner; Figures 2, 5; column 4 lines 15-25).

-***-Continued Within the Next Supplemental Box-***-

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:

-***-Continued from Previous Supplemental Box-***-
Claim 1 lacks an inventive step under PCT Article 33(3) as being obvious over Griner.

As per claim 1, Griner discloses a massage device (device 10 is used to massage the user's muscles; Figure 1, column 2 lines 30-35) comprising, a housing (the massage device includes an outer housing 11 comprising of the middle body portion 12 and end caps 13, 14; Figure 2, column 2 lines 35-40), an electrical input (plug 20 provides a connection to a suitable electrical outlet via an electrical conduit 22; Figure 2, column 2 lines 45-50), a motor (motor 23 drives the pulley 25 system; Figure 3, column 2 lines 55-58), a switch (a switch is shown on top of housing 11, between supports 16; Figure 3), an actuated output operatively connected to the motor and configured to reciprocate in response to activation of the motor (a plunger body 37 is attached via links to reciprocate in response to the motor 23; Figures 3, 6, column 3 lines 24-31) (motor 23 drives a pulley 25 which includes a ramp 28 that causes the plunger support 35 to move back and forth in a linear manner cause the tip 47 to move in the same manner since it is rigidly connected to the plunger support 35; Figure 3, column 2 line 55 to column 3 line 17), and a treatment structure operatively connected to a distal end of the actuated output (tip 47 (treatment structure) is conical in shape and moves up and down with the plunger body 37; Figure 3, column 3 lines 12-17), wherein the actuated output is configured to reciprocate the treatment structure at a frequency of between about 15 Hz and about 100 Hz (the plunger pulsates 15 times per second; claim 10), and at an amplitude of between about 0.15 and about 1.0 inches (ramp 28, which causes the plunger body 37 to reciprocate, determines the length of the stroke by its height, 0.280 in.; Figure 7, column 3 lines 35-38), and wherein the combination of amplitude and frequency provides efficient reciprocation of the treatment structure such that the treatment structure provides therapeutically beneficial treatment to a targeted muscle of a user (producing a 0.0705 second dwell time (c) and a 0.0075 second pulse duration (d) yields a greater depth of muscle stimulation; Figures 10, 11, column 3 line 65 to column 4 line 2). Griner does not disclose a switch in electrical communication with the electrical input and the motor, the switch configured to selectively provide power from the electrical input to the motor. It would have been obvious to one of ordinary skill in the art at the time of invention to modify Griner to include connect the switch between the electrical input and the motor because it would provide the user the ability to turn the motor on and off while the device is plugged into an electrical outlet or connected to a battery source, allowing the user to operate the device more easily.

Claims 5, 12 lack an inventive step under PCT Article 33(3) as being obvious over Yoo in view of Griner and further in view of US 4,730,605 A to Noble, et al., hereinafter "Noble".

As per claim 5, Yoo in view of Griner discloses the massage device of claim 3. Yoo does not disclose wherein the gear member comprises a counterweight disposed on the gear member, and wherein the center of mass of the counterweight is not on the gear rotation axis. Noble does discloses wherein the gear member comprises a counterweight disposed on the gear member (eccentric counterbalance weight 52 is attached to eccentric 50 in order to eliminate unwanted vibrations; Figure 4, column 3 lines 22-25), and wherein the center of mass of the counterweight is not on the gear rotation axis (the eccentric counterbalance weight 52 ensures that the eccentric 50 is balanced and thus means the center of mass is not along the gear rotation axis; Figure 4, column 3 lines 22-25). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Yoo to include a counterweight on the gear member where the center of mass is not on the axis of rotation because, as Noble teaches, it reduces the amount of unwanted vibrations resulting in a smoother experience for the user.

As per claim 12, Yoo in view of Griner discloses the reciprocating treatment device of claim 11. Yoo does not disclose wherein the gear member comprises a counterweight disposed on the gear member, and wherein the center of mass of the counterweight is not on the gear rotation axis. Noble discloses wherein the gear member comprises a counterweight disposed on the gear member (eccentric counterbalance weight 52 is attached to eccentric 50 in order to eliminate unwanted vibrations; Figure 4, column 3 lines 22-25), and wherein the center of mass of the counterweight is not on the gear rotation axis (the eccentric counterbalance weight 52 ensures that the eccentric 50 is balanced and thus means the center of mass is not along the gear rotation axis; Figure 4, column 3 lines 22-25). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Yoo to include a counterweight on the gear member where the center of mass is not on the axis of rotation because, as Noble teaches, it reduces the amount of unwanted vibrations resulting in a smoother experience for the user.

Claim 6 lacks an inventive step under PCT Article 33(3) as being obvious over Yoo in view of Griner and further in view of US 5,417,644 A to Lee et al., hereinafter "Lee".

As per claim 6, Yoo discloses the massage device of claim 4. Yoo does not disclose wherein the head of the reciprocator shaft includes an elongated opening therein, wherein the eccentric interface comprises a pin, and wherein the pin is configured to move within the elongated opening as the gear member rotates. Lee discloses the head of the reciprocator shaft includes an elongated opening therein (slant guide area 30 (elongated opening) guides bearing 26 and applies horizontal forces on the sliding member 28; Figure 3A, column 2 lines 60-65), wherein the eccentric interface comprises a pin (bearing 26 acts as a pin as it is the connection between the driving shaft 22 and the sliding member 28; Figure 3A, column 2 lines 65-68), and wherein the pin is configured to move within the elongated opening as the gear member rotates (bearing 26 moves within the slant guide area 30 (elongated opening) as it is driven by driving shaft 22; Figures 3A, 3B, column 2 lines 60-68). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Yoo to include the elongated opening and rotating pin of Lee because, as Lee teaches, it translates circular motion into linear motion with very few components being rigidly connected, thus resulting in an easier construction.

-***-Continued Within the Next Supplemental Box-***-

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

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Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
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-***-Continued from Previous Supplemental Box-***-
Claim 7 meets the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest the massage device of claim 1 further comprising a rotation housing, wherein the housing includes a rotation space defined therein, wherein the rotation housing includes a main body portion disposed in the housing and an arm portion extending through the rotation space and outside the housing, wherein the actuated output extends outwardly from the arm portion, and wherein the rotation housing can rotate within the rotation space between a plurality of positions.

Griner discloses the massage device. Griner does not disclose further comprising a rotation housing, wherein the housing includes a rotation space defined therein, wherein the rotation housing includes a main body portion disposed in the housing and an arm portion extending through the rotation space and outside the housing, wherein the actuated output extends outwardly from the arm portion, and wherein the rotation housing can rotate within the rotation space between a plurality of positions.

Yoo in view of Griner discloses the massage device. Yoo in view of Griner does not disclose further comprising a rotation housing, wherein the housing includes a rotation space defined therein, wherein the rotation housing includes a main body portion disposed in the housing and an arm portion extending through the rotation space and outside the housing, wherein the actuated output extends outwardly from the arm portion, and wherein the rotation housing can rotate within the rotation space between a plurality of positions.

Lee does not disclose further comprising a rotation housing, wherein the housing includes a rotation space defined therein, wherein the rotation housing includes a main body portion disposed in the housing and an arm portion extending through the rotation space and outside the housing, wherein the actuated output extends outwardly from the arm portion, and wherein the rotation housing can rotate within the rotation space between a plurality of positions.

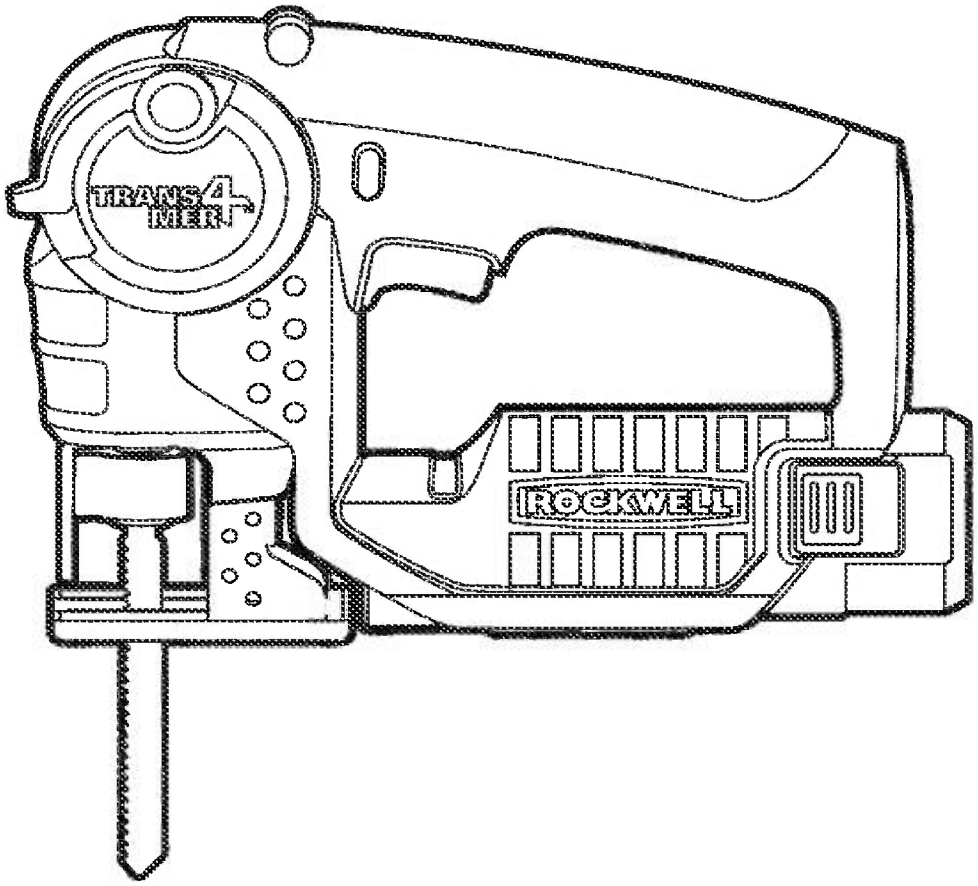
Noble discloses the massage device. Noble does not disclose further comprising a rotation housing, wherein the housing includes a rotation space defined therein, wherein the rotation housing includes a main body portion disposed in the housing and an arm portion extending through the rotation space and outside the housing, wherein the actuated output extends outwardly from the arm portion, and wherein the rotation housing can rotate within the rotation space between a plurality of positions.

None of the references record disclose further comprising a rotation housing, wherein the housing includes a rotation space defined therein, wherein the rotation housing includes a main body portion disposed in the housing and an arm portion extending through the rotation space and outside the housing, wherein the actuated output extends outwardly from the arm portion, and wherein the rotation housing can rotate within the rotation space between a plurality of positions. Furthermore, it would not have been obvious to one of ordinary skill in the art at the time of invention to modify Griner, Yoo, Lee, or Noble to include a rotatable housing with the actuated output extending outwards from the arm portion of the rotatable housing because massage devices are usually mobile enough to rotate the device itself rather than have part of the device rotate to accommodate the user.

Claim 8 meets the criteria set out in PCT Article 33(2)-(3), because it is dependent upon claim 7.

Claims 1-13 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used in industry.

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MULTI-PURPOSE SAW	PAGE 5	ENG
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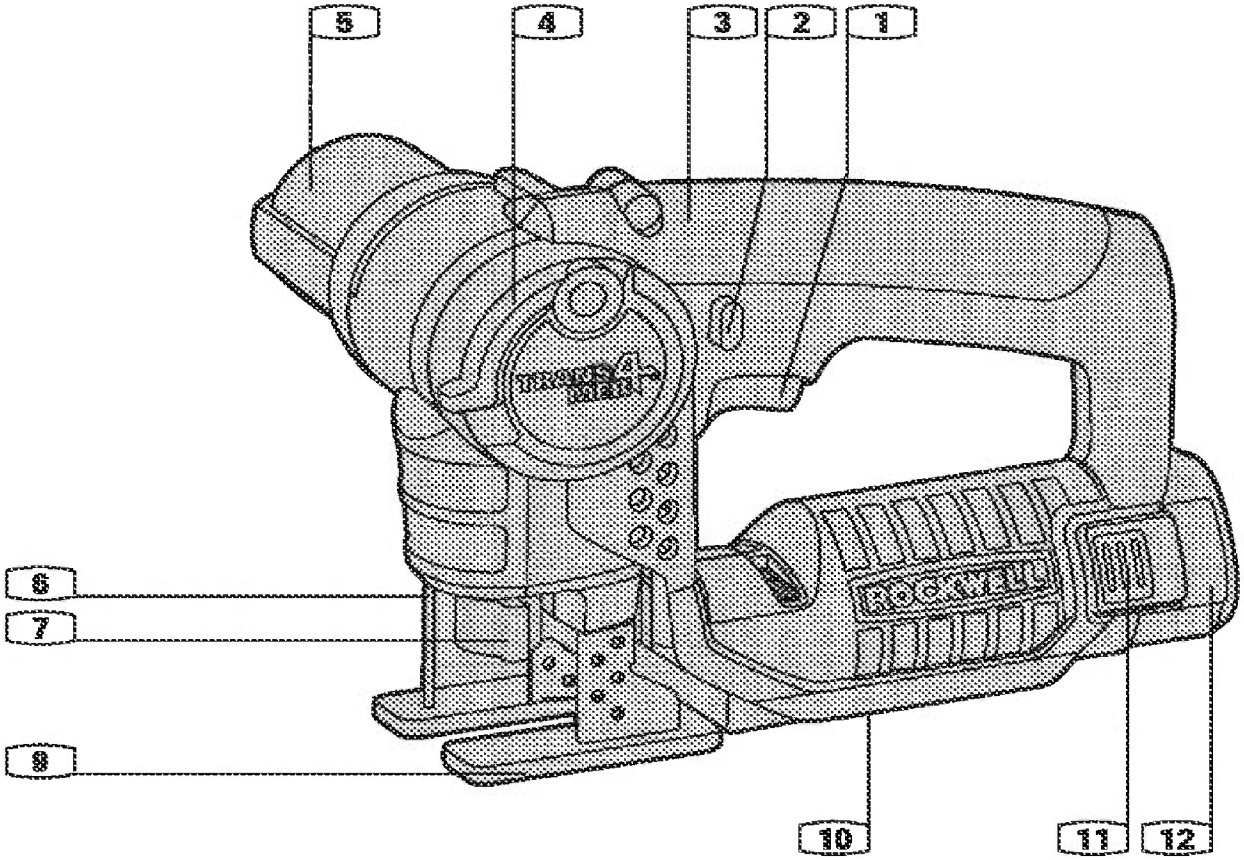
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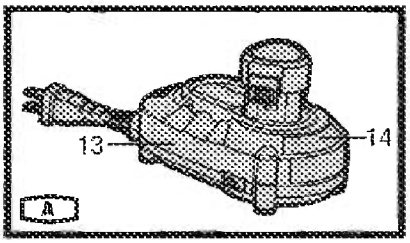


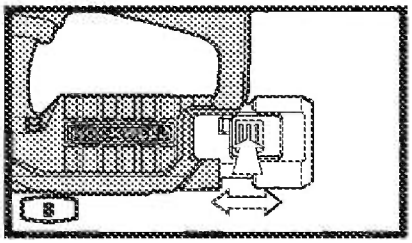
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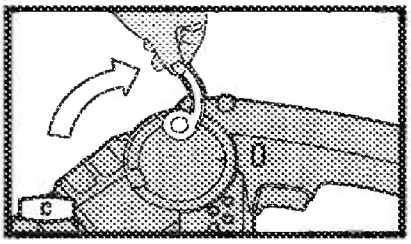
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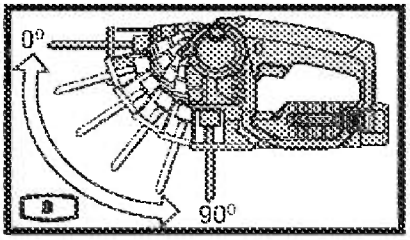
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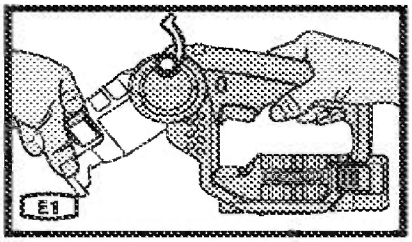


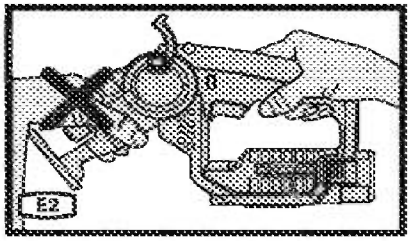




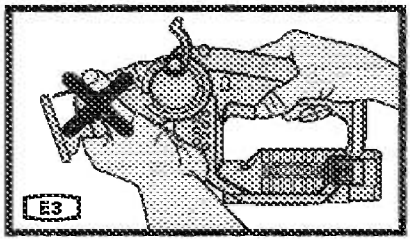


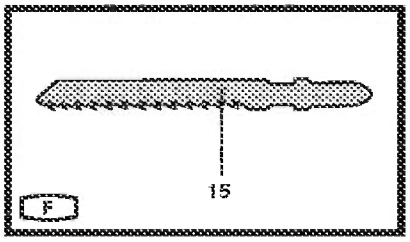


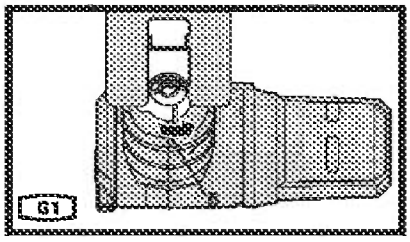


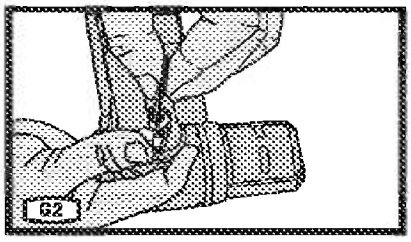


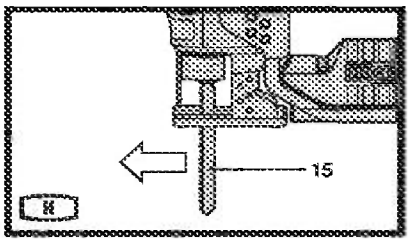
RK2516/RK2516K

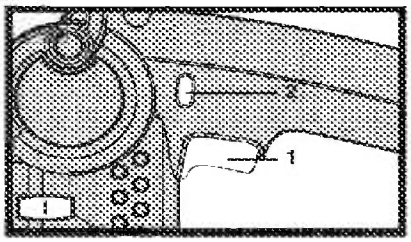












COMPONENT LIST

1. ON/OFF SWITCH
2. LOCK-OFF BUTTON
3. HAND GRIP AREAS
4. PIVOT RELEASE LEVER
5. MOTOR COVER
6. PROTECTION FINGER
7. BLADE HOLDER
8. LED WORK LIGHT (SEE FIG. G1)
9. FOOT PLATE
10. BASE PLATE
11. BATTERY RELEASE BUTTON
12. BATTERY PACK *
13. CHARGER (SEE FIG. A) *
14. CHARGED INDICATOR LIGHT (SEE FIG. A)
15. BLADE (SEE FIG. F)

*** Not all the accessories illustrated or described are included in standard delivery.**

ACCESSORIES

RK2516

Metal cutting blade	1
Wood cutting blade	1

RK2516K

30 min charger (RW9400)	1
1.3Ah Li-Ion battery pack (RW9300)	1
Metal cutting blade	1
Wood cutting blade	1

You can only use the t-shank blade type shown in Fig F. Don't use other blade types.

We recommend that you purchase your accessories from the same store that sold you the tool. Use good quality accessories marked with a well-known brand name. Choose the type according to the work you intend to undertake. Refer to the accessory packaging for further details. Store personnel can assist you and offer advice.

GENERAL POWER TOOL SAFETY WARNINGS

WARNING!Read all safety warnings and instructions. Failure to follow the warnings and instructions may result in electric shock, fire and/or serious injury.

Save all warnings and instructions for future reference.

The term power tool in the warnings refers to your mains-operated (corded) power tool or battery-operated (cordless) power tool.

1. WORK AREA SAFETY

a) Keep work area clean and well lit. Cluttered or dark areas invite accidents.

b) Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases or dust. Power tools create sparks which may ignite the dust or fumes.

c) Keep children and bystanders away while operating a power tool. Distractions can cause you to lose control.

2. ELECTRICAL SAFETY

a) Power tool plugs must match the outlet. Never modify the plug in any way. Do not use any adapter plugs with grounded power tools. Unmodified plugs and matching outlets will reduce risk of electric shock.

b) Avoid body contact with grounded surfaces such as pipes, radiators, ranges and refrigerators. There is an increased risk of electric shock if your body is earthed or grounded.

c) Do not expose power tools to rain or wet conditions. Water entering a power tool will increase the risk of electric shock.

d) Do not abuse the cord. Never use the cord for carrying, pulling or unplugging the power tool. Keep cord away from heat, oil, sharp edges or moving parts. Damaged or entangled cords increase the risk of electric shock.

e) When operating a power tool outdoors, use an extension cord suitable for outdoor use marked "W-A" or "W". Use of a cord suitable for outdoor use reduces the risk of electric shock.

f) If operating a power tool in a damp location is unavoidable, use a Ground Fault Circuit Interupter (GFCI) protected supply. Use of a GFCI reduces the risk of electric shock.

3. PERSONAL SAFETY

a) Stay alert, watch what you are doing and use common sense when operating a power tool. Do not use a power tool while you are tired or under the influence of drugs, alcohol or medication. A moment of inattention while operating power tools may result in serious personal injury.

b) Use personal protective equipment. Always wear eye protection. Protective equipment such as dust mask, non-skid safety shoes, hard hat, or hearing protection used for appropriate conditions will reduce personal injuries.

c) Prevent unintentional starting. Ensure the switch is in the off-position before connecting to power source and/or battery pack, picking up or carrying the tool. Carrying power tools with your finger on the switch or energizing power tools that have the switch on invites accidents.

d) Remove any adjusting key or wrench before turning the power tool on. A wrench or a key left attached to a rotating part of the power tool may result in personal injury.

e) Do not overreach. Keep proper footing and balance at all times. This enables better control of the power tool in unexpected situations.

f) Dress properly. Do not wear loose clothing or jewelry. Keep your hair, clothing and gloves away from moving parts. Loose clothes, jewelry or long hair can be caught in moving parts.

g) If devices are provided for the connection of dust extraction and collection facilities, ensure these are connected and properly used. Use of dust collection can reduce dust-related hazards.

4. POWER TOOL USE AND CARE

a) Do not force the power tool. Use the correct power tool for your application. The correct power tool will do the job better and safer at the rate for which it was designed.

b) Do not use the power tool if the switch does not turn it on and off. Any power tool that cannot be controlled with the switch is dangerous and must

be repaired.

c) **Disconnect the plug from the power source and/or the battery pack from the power tool before making any adjustments, changing accessories, or storing power tools.** Such preventive safety measures reduce the risk of starting the power tool accidentally.

d) **Store idle power tools out of the reach of children and do not allow persons unfamiliar with the power tool or these instructions to operate the power tool.** Power tools are dangerous in the hands of untrained users.

e) **Maintain power tools. Check for misalignment or binding of moving parts, breakage of parts and any other condition that may affect the power tool's operation. If damaged, have the power tool repaired before use.** Many accidents are caused by poorly maintained power tools.

f) **Keep cutting tools sharp and clean.** Properly maintained cutting tools with sharp cutting edges are less likely to bind and are easier to control.

g) **Use the power tool, accessories and tool bits etc., in accordance with these instructions and in the manner intended for the particular type of power tool, taking into account the working conditions and the work to be performed.** Use of the power tool for operations different from those intended could result in a hazardous situation.

h) **Use clamps or another practical way to secure and support the workpiece to a stable platform.**

i) **Holding the work by hand or against your body leaves it unstable and may lead to loss of control.**

5. BATTERY TOOL USE AND CARE

a) **Recharge only with the charger specified by the manufacturer.** A charger that is suitable for one type of battery pack may create a risk of fire when used with another battery pack.

b) **Use power tools only with specifically designated battery packs.** Use of any other battery packs may create a risk of injury and fire.

c) **When battery pack is not in use, keep it away from other metal objects, like paper clips, coins, keys, nails, screws or other small metal objects, that can make a connection from one terminal to another.** Shorting the battery terminals together may cause burns or a fire.

d) **Under abusive conditions, liquid may be ejected from the battery; avoid contact. If contact accidentally occurs, flush with water. If liquid contacts eyes, additionally seek medical help.** Liquid ejected from the battery may cause irritation or burns.

6. SERVICE

a) **Have your power tool serviced by a qualified repair person using only identical replacement parts.** This will ensure that the safety of the power tool is maintained.

WARNING: Some dust created by power sanding, sawing, grinding, drilling and other construction activities contains chemicals known to the state of California to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:

- **Lead from lead-based paints.**
- **Crystalline silica from bricks and cement and other masonry products and.**
- **Arsenic and chromium from chemically-treated lumber.**

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles.

ADDITIONAL SAFETY RULES FOR YOUR TOOL

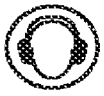
1. **Always wear a dust mask.**
2. **Hold power tool by insulated gripping surfaces when performing an operation where the cutting tool may contact hidden wiring.** Contact with a "live" wire will make exposed metal parts of the tool "live" and shock the operator.
3. **Use clamps or another practical way to secure and support the workpiece to a stable platform.** Holding the work by hand or against your body leaves it unstable and may lead to loss of control.

4. **Always wear safety glasses or eye shields when using the multi-purpose saw. Everyday eyeglasses have only impact-resistant lenses; they are not safety glasses.** Following this rule will reduce the risk of serious personal injury.
5. **Always wear hearing protection during extended periods of operation.** Following this rule will reduce the risk of serious personal injury.
6. **Keep your hands away from cutting area.** Do not reach under the material being cut because the nearness of the blade to your hand is hidden from your sight.
7. **Do not use dull or damaged blades.** Bent blades can break easily, or cause kickback.
8. **Always check walls, floors and ceilings to avoid hidden power cables and pipes.**
9. **After long working period, external metal parts and accessories could be hot.**
10. **Only withdraw the blade from the cut when the blade has stopped moving.**
11. **The pivoting blade foot must be held firmly against the material being cut to reduce saw vibration, blade jumping and blade breakage.**
12. **Before cutting, check that the cutting line is free of nails, screws, etc.**
13. **Never stop the cutting blade by applying side pressure to the blade.**
14. **Your multi-purpose saw is a hand held tool; do not clamp your multi-purpose saw.**
15. **Remove the battery pack from the saw before carrying out adjustments.**
16. **Do not incinerate or burn the battery pack, it may explode.**
17. **Do not charge a damaged battery pack.**
18. **Do not charge non-rechargeable batteries.**
19. **Battery pack and charger will be warm during charging, this is normal.**
20. **Always remove the battery pack from the charger immediately after re-charging is completed.**
21. **Do not dispose of batteries.** Return exhausted batteries to your local collection or recycling point.

SYMBOLS


To reduce the risk of injury, user must read instruction manual.


Warning


Wear ear protection


Wear eye protection


Wear dust mask


Do not expose to rain or water


Do not burn



Always charge the battery pack between temperatures 32°F(0°C)to 86°F(30°C)

TECHNICAL DATA

Rated Voltage		12 V ⎓
No load speed		2200 spm
Stroke length		5/8"
Max cutting depth in		
	Wood	2"
	Aluminum	1- 3/4"
	Steel	5/32"
Machine weight		2.6 lbs

OPERATING INSTRUCTIONS

NOTE: Before using the tool, read the instruction book carefully.

CHARGING PROCEDURE

1. CHARGING YOUR BATTERY PACK

WARNING: The charger and battery pack are specifically designed to work together so do not attempt to use any other devices. Never insert or allow metallic objects into your charger or battery pack connections because an electrical failure and hazard will occur.

2. BEFORE USING YOUR CORDLESS TOOL

Your battery pack is UNCHARGED and you must charge once before use. When you charge the new battery or one which has not been used for long periods of time, it may not reach full charge until after you have discharged it fully in use and recharged it several times.

3. HOW TO CHARGE YOUR BATTERY PACK (SEE FIG. A)

1) Plug the charger into an appropriate outlet. The light will be green.
2) Insert the battery pack into the charger, the light will be red to indicate the charging process has started.
3) On completion of charge, the light will turn green. The pack is now fully charged, unplug the charger and remove the battery pack.

WARNING: When battery charge runs out after continuous use or exposure to direct sunlight or heat, allow time for the battery to cool down before re-charging to achieve the full charge.

4. TO REMOVE OR INSTALL BATTERY PACK (SEE FIG. B)

Locate buttons on side of battery pack and depress both sides to release battery pack from your tool. Remove battery pack from your tool. After recharge insert the battery pack into the battery port. A simple push and slight pressure will be sufficient.

ADJUSTMENT

This tool functions as a combination jigsaw and reciprocating saw. Use the pivot release lever (4) to change the configuration.

Lift up the pivot release lever fully, until it cannot be lifted further. (See Fig. C)

Rotate the front portion of the tool into any of the SIX positions (0, 18, 36, 54, 72 and 90deg) (See Fig. D).

Restore the pivot release lever.

In Position I (0deg), this tool can be used as a reciprocating saw.

In Position VI (90deg), this tool can be used as a jigsaw.

WARNING!

When adjusting the tool, you can only hold the foot plate as shown in Fig.E1. Never hold the pivot head as shown in Fig. E2, E3.

WARNING!

- To avoid being pinched, keep hands away from the hinge when changing positions.
- To avoid tool being turned on accidentally, remove the battery pack from the tool.

REPLACING / INSERTING THE SAW BLADE

Before any work on the machine itself, remove the battery.

The blade should extend past the foot plate and the thickness of the workpiece during the cut. Select the blade best suitable for the material to be cut and use the shortest blade suitable for the thickness of the material.

WARNING! Cut hazard. Blade breakage may occur if the blade does not extend past the foot plate and the workpiece during the cut. Increased risk of personal injury, as well as damage to the foot plate and workpiece may result.

CAUTION: Remove the battery pack to prevent switch actuation before making any adjustments or removing or installing attachments or accessories.

---INSERTING THE SAW BLADE (SEE FIG. F-H)

Wear protective gloves when assembling the saw blade. Contact with the saw blade can lead to injuries.

You can only use the t-shank blade type shown in Fig F.

The machine is equipped with a tool-free blade holder (7). This makes possible easy and quick changing of the saw blade without any additional tools.

Rotate the ring counterclockwise and hold in position.

Fully insert the blade into the blade holder slot with blade teeth facing forward then release the ring, which will self-rotate and clamp over the top of the blade. (See Fig. G1&G2)

—REMOVING THE SAW BLADE

To remove a blade, hold the blade and rotate the blade holder ring counterclockwise to release the blade.

WARNING: The blade may be spring ejected so protect your eyes.

NOTE: When using JIGSAW MODE, the blade teeth face forward as shown in Fig. H.

OPERATION

WARNING: Always wear eye protection while operating this or any other power tool.

WARNING: Burn hazard. Do not touch the blade immediately after use. Contact with the blade may result in personal injury.

Before you begin work, ensure the material to be cut is rigid. Small workpieces should be securely clamped to a work table.

1. SWITCHING ON AND OFF (SEE FIG. I)

For starting operation of the machine, actuate the lock-off button (2) first, then press and hold the On/Off switch (1) afterwards. To switch off the machine, release the On/Off switch (1).

For safety reasons the On/Off switch of the machine cannot be locked; it must remain pressed during the entire operation.

2. HAND GRIP AREAS

Always ensure you maintain a firm grip while operating your jigsaw.

3. PROTECTION FINGER

The protection finger (6) is located in front of the blade holder (7). While working, it will help prevent accidental contact with the moving blade.

4. LED WORK LIGHT (SEE FIG. G1)

A light (8) is built-in near the end of the protection finger. The light will automatically come on each time the on/off switch is depressed.

5. CUTTING

WARNING: Always wear eye protection while operating this power tool.

WARNING:

• Never hold the pivot head when operating the tool. Before cutting any type of material, be sure it is firmly anchored or clamped to prevent slipping. Holding the work by hand or against your body leaves it unstable and may lead to loss of control.

• Place blade lightly against work to be cut, depress the trigger switch and allow it to obtain maximum speed before applying pressure.

• Whenever possible, the saw foot plate must be held firmly against the material being cut. This will prevent the saw from jumping or vibrating and minimize blade breakage.

Any cut which puts pressure on the blade, such as angle or scroll cuts, increases potential for vibration, kickback and blade breakage.

WARNING: Shock hazard. Use extra caution when cutting overhead and pay particular attention to overhead wires which may be hidden from view.

WARNING: Use extra caution when cutting overhead and anticipate the path of falling branches and debris ahead of time.

WARNING: Inspect work site for hidden gas pipes, water pipes, or electrical wires before making blind or plunge cuts. Failure to do so may result in explosion, property damage, electric shock, and/or serious personal injury.

WORKING HINTS FOR YOUR MULTI-PURPOSE SAW

If your power tool becomes too hot, set the speed to maximum and run no-load for 2-3 minutes to cool the motor. Avoid prolonged usage at very low speeds.

GENERAL

Always use a blade suited to the material and material thickness to be cut.

Always ensure the work–piece is firmly held or clamped to prevent movement.

Any movement of the material may affect the quality of the cut. The blade cuts on the upward stroke and may chip the uppermost surface.

Ensure your uppermost surface is a non-visible surface when your work is finished.

MAINTENANCE

Your power tool requires no additional lubrication or maintenance.
There are no user serviceable parts in your power tool. Never use water or chemical cleaners to clean your power tool. Wipe clean with a dry cloth. Always store your power tool in a dry place. Keep the motor ventilation slots clean. Keep all working controls free of dust. Occasionally you may see sparks through the ventilation slots. This is normal and will not damage your power tool.

TROUBLESHOOTING

Symptom	Possible Causes	Possible Solution
The tool suddenly stops during operation.	Over load Battery temperature too high Low battery capacity	Relieve the load on the machine immediately and allow cooling for approx. 30 seconds at the highest no-load speed. Charge the battery pack.

2-YEAR WARRANTY STATEMENT

If your Rockwell tool becomes defective due to faulty materials or workmanship within a period of 2 years from the date of purchase, we guarantee to:

- Replace or repair all defective parts, free of charge, or.
- Repair products free of charge, or.
- Replace the unit with a new or re-conditioned unit, free of charge.

Your warranty is subject to the following conditions:

- Battery packs are guaranteed for a 12 month period only.
- The tool has not been misused, abused, neglected, altered, modified or repaired by anyone other than an authorized service center.
- Only genuine Rockwell accessories and parts have been used on or with the product.
- The tool has been subjected to fair wear and tear.
- The tool has not been used for rental purposes.
- The tool has not sustained damage through foreign objects, substances or accidents.

Your warranty does not cover:

- Components that are subject to natural wear and tear caused by use in accordance with operating instructions.
- Unauthorized/improper maintenance/handling or overload are excluded from this warranty as are accessories such as bulbs, blades and bits, etc.

For guarantee claims, please contact the Rockwell Helpline and you will need to submit a proof of purchase in the form of a valid receipt that displays date and place of purchase.
We may require the tool be sent postage prepaid to an authorized service center, along with all original equipment.

Rockwell Helpline 866-514-ROCK(7625)
This guarantee statement does not replace but is in addition to your statutory rights.
This warranty does not apply to accessories supplied with the tool.
This warranty applies only to the original purchaser and may not be transferred.
All repairs and replacement tools will be covered by the limited warranty for the balance of the warranty period from the date of the original purchase.

Limited 30-Day exchange policy
During the first 30 days after date of purchase, you may exchange a tool which does not work properly due to defects in materials or workmanship by returning the power tool to the retailer where it was purchased. To receive a replacement power tool, you must present a dated proof of purchase and return all original equipment packaged with the original product. The replacement power tool will be covered by the limited warranty for the balance of the two year period from the date of the original purchase.

LISTA DE PARTES

1. GATILLO DE ENCENDIDO/APAGADO
2. INTERRUPTOR DE DESTRABADO
3. ÁREA DE AGARRE
4. INTERRUPTOR DESLIZANTE DE LIBERACIÓN DE ROTACIÓN
5. CUBIERTA DEL MOTOR
6. BARRA DE SEGURIDAD DE LA HOJA
7. SOPORTE DE LA HOJA
8. LUZ DEL TRABAJO (VER FIG. G1)
9. ZAPATA
10. BASE
11. LENGÜETAS DE LIBERACIÓN DE LAS BATERÍAS
12. PAQUETE DE BATERÍAS *
13. CARGADOR (VER FIG. A) *
14. LUZ INDICADORA DE CARGA (VER FIG. A)
15. HOJAS VARIAS (VER FIG. F)

*** No todos los accesorios ilustrados o descritos se incluyen junto con el producto estándar.**

ACCESORIOS

RK2516

Hoja para corte de metal	1
Hoja para corte de maner	1

RK2516K

30 min Cargador (RW9400)	1
1.3 Ah Batería de Litio (RW9300)	1
Hoja para corte de metal	1
Hoja para corte de maner	1

Puede usar únicamente el tipo de hojas con vástagos en T mostrado en la Fig F.

Le recomendamos que compre todos los accesorios en la tienda donde adquirió la herramienta. Use accesorios de buena calidad una marca bien conocida. Seleccione los que más convengan al trabajo que intenta hacer. Consulte el empaque de los accesorios para obtener más detalles. El personal de la tienda también puede ayudarle y aconsejarle.

¡ADVERTENCIAS DE SEGURIDAD GENERALES PARA LA HERRAMIENTA MOTORIZADA

¡ADVERTENCIA! LEA Y COMPRENDA TODAS LAS INSTRUCCIONES. El no seguir todas las instrucciones a continuación puede ocasionar descargas eléctricas, incendios y/o heridas graves.

Conserve todas las advertencias e instrucciones para consulta futura.

El término "herramienta eléctrica" que figura en todas las advertencias que aparecen a continuación hace referencia a la herramienta que funciona con la red de suministro eléctrico (con cable) o a la herramienta eléctrica accionada a baterías (sin cable).

1. ÁREA DE TRABAJO

a) **Mantenga su lugar de trabajo limpio y bien iluminado.** Bancos de trabajo desordenados y lugares oscuros invitan a los accidentes.

b) **No utilice herramientas eléctricas en atmósferas explosivas, como por ejemplo en presencia de líquidos, inflamables, gases o polvo.** Las herramientas eléctricas crean chispas que pueden encender el polvo o los vapores.

c) **Mantenga a los espectadores, niños y visitantes a una distancia prudente cuando esté utilizando una herramienta eléctrica.** Las distracciones pueden hacerle perder el control.

2. SEGURIDAD ELÉCTRICA

a) **Los enchufes de las herramientas eléctricas deben coincidir con el tomacorriente. No modifique de algún modo el enchufe. No utilice enchufes adaptadores con herramientas eléctricas conectadas a tierra.** Si no se modifican los enchufes y se utilizan los tomacorrientes adecuados, se reducirá el riesgo de una descarga eléctrica.

b) **Evite el contacto del cuerpo con las superficies conectadas a tierra tales como tuberías, radiadores, estufas de cocina y refrigeradores.** Existe mayor riesgo de que se produzcan descargas eléctricas si su cuerpo está conectado a tierra.

c) **No exponga las herramientas eléctricas a la lluvia ni a los ambientes húmedos.** La entrada de agua en una herramienta eléctrica aumenta el riesgo de que se produzcan descargas eléctricas.

d) **No abuse del cable.** Nunca use el cable para transportar las herramientas ni para sacar el enchufe de un tomacorriente. Mantenga el cable alejado del calor, el aceite, los bordes afilados o las piezas móviles. Los cables dañados aumentan el riesgo de que se produzcan descargas eléctricas.

e) **Cuando utilice una herramienta eléctrica en exteriores, utilice un cable de extensión apto para uso exterior.** La utilización de un cable de extensión reducirá el riesgo de una descarga eléctrica.

f) **Si no se puede evitar la utilización de una herramienta motorizada en una ubicación húmeda, utilice un suministro de alimentación protegido por un interruptor de circuito accionado por corriente de pérdida a tierra (GFCI).** El uso de un GFCI reduce el riesgo de descarga eléctrica.

3. SEGURIDAD PERSONAL

a) **Manténgase alerta, fíjese en lo que está haciendo y use el sentido común cuando utilice una herramienta eléctrica. No use la herramienta cuando esté cansado o se encuentre bajo la influencia de drogas, alcohol o medicamentos.** Un momento de distracción al utilizar herramientas eléctricas puede dar lugar a lesiones personales graves.

b) **Utilice equipo de seguridad. Use siempre protección ocular.** La utilización del equipo de seguridad como mascara antipolvo, zapatos de seguridad antideslizantaes, casco o protección auditiva para condiciones adecuadas reducirá el riego de lesiones personales.

c) **Evite el arranque accidental. Asegúrese de que el interruptor esté en la posición de trabado o de apagado antes de instalar el paquete de baterías.** Transportar herramientas con el dedo en el interruptor o instalar el paquete de batería cuando el interruptor está encendido invitan a los accidentes.

d) **Retire las llaves o claves de ajuste antes de encender la herramienta.** Una llave o clave de ajuste dejada en una parte giratoria de la herramienta puede causar una lesión personal.

e) **No intente alcanzar demasiado lejos.**

Mantenga un apoyo de los pies y un equilibrio adecuados en todo momento. El apoyo de los pies y el equilibrio adecuados permiten un mejor control de la herramienta en situaciones inesperadas.

f) **Vístase apropiadamente. No se ponga ropa holgada ni joyas. Mantenga su cabello, ropa y guantes alejados de las piezas móviles.** La ropa holgada, las joyas o el pelo largo pueden quedar atrapados en las piezas móviles.

g) **Si se proporcionan dispositivos para la extracción y recolección de polvo, asegúrese que estos estén conectados y utilizados correctamente.** El uso de estos dispositivos puede reducir peligros relacionados con el polvo.

4. USO Y CUIDADO DE LA HERRAMIENTA

a) **No fuerce la herramienta. Emplee la herramienta correcta para la aplicación que desea.** La herramienta correcta hará el trabajo mejor y con más seguridad a la capacidad nominal para la que está diseñada.

b) **No utilice la herramienta si el interruptor no la enciende o apaga.** Toda herramienta que no se pueda controlar con el interruptor es peligrosa y debe ser reparada.

c) **Desconecte la batería de la herramienta o ponga el interruptor en la posición de trabado o de apagado antes de hacer cualquier ajuste, cambio de accesorios o guardar la herramienta.** Estas medidas de seguridad preventivas reducen el riesgo de encender la herramienta accidentalmente.

d) **Guarde las herramientas que no esté usando fuera del alcance de los niños y otras personas no capacitadas.** Las herramientas son peligrosas en las manos de los usuarios no capacitados.

e) **Mantenga las herramientas con cuidado. Compruebe la desalineación o el atasco de las piezas móviles, la ruptura de piezas y cualquier otra situación que pueda afectar el funcionamiento de las herramientas. Si la herramienta está dañada, hágala arreglar antes de usarla.** Muchos accidentes son causados por herramientas mantenidas deficientemente.

f) **Conserve las herramientas de corte afiladas y limpias.** Las herramientas mantenidas adecuadamente, con bordes de corte afilados, tienen menos probabilidades de atascarse y son más fáciles de controlar.

g) **Utilice la herramienta eléctrica, accesorios, brocas de la herramienta, etc. de acuerdo con estas instrucciones y de la manera adecuada para el tipo de herramienta eléctrica, teniendo en cuenta las condiciones de trabajo y el trabajo que se realizará.** La utilización de la herramienta eléctrica para operaciones diferentes de aquellas para las que se encuentra diseñada podría dar lugar a una situación peligrosa.

h) **Fijar la pieza sobre la mesa estable con clip o medios alternativos.**

i) **Fijar la pieza de mano o la apoyar contra el cuerpo llevará a cabo la operación inestable, podrá estar fuera de control.**

5. UTILIZACIÓN Y CUIDADO DE LA HERRAMIENTA ACCIONADA A BATERÍAS

a) **Una herramienta accionada a baterías que tenga baterías integradas o un paquete de baterías separado se debe recargar solamente con el cargador especificado para la batería.** Un cargador que puede ser adecuado para un tipo de batería puede crear un peligro de incendio cuando se usa con otra batería.

b) **Utilice la herramienta accionada a baterías solamente con el paquete de baterías designado específicamente.** El uso de cualquier otra batería puede crear un peligro de incendio.

c) **Cuando el paquete de baterías no se usa, manténgalo alejado de otros objetos metálicos como: sujetapapeles, monedas, clavos, tornillos u otros pequeños objetos de metal capaces de hacer una conexión entre los terminales.** El cortocircuito de los terminales de una batería puede causar chispas, quemaduras o incendio.

d) **Bajo condiciones abusivas, la batería puede expulsar líquido; evite el contacto. Si ocurre un contacto accidental, enjuagar con agua.** Si el líquido entra en contacto con los ojos, busque ayuda médica. El líquido expulsado por la batería puede causar irritación o quemaduras.

6. REPARACIÓN

a) La herramienta debe ser reparada por una persona calificada de servicio técnico y se deben utilizar partes de reemplazo idénticas. Esto asegurará el mantenimiento de la seguridad de la herramienta eléctrica.

¡ADVERTENCIA! El polvo creado al lijar, serruchar, pulir, taladrar o realizar otras actividades de la construcción, contiene substancias químicas que se sabe producen cáncer, defectos de nacimiento u otros daños al sistema reproductor. Algunos ejemplos de esos productos químicos son:

- **El plomo de las pinturas a base de plomo.**
- **La sílice cristalina de los ladrillos, del cemento y de otros productos de albañilería.**
- **El arsénico y el cromo de la madera tratada químicamente.**

El riesgo que se corre a causa del contacto con esos productos varía según la frecuencia con que usted realice este tipo de trabajos. Con el fin de reducir su exposición a esas substancias químicas: trabaje en un área bien ventilada; utilice un equipo de seguridad adecuado, tal como una màscara contra el polvo especialmente diseñada para filtrar partículas microscópicas.

INFORMACIÓN DE SEGURIDAD ADICIONAL DE LA HERRAMIENTA

1. **Use siempre una máscara anti-polvo.**
2. **Sujete la herramienta por las áreas de agarre aisladas cuando realice una operación en la que la herramienta de corte pueda entrar en contacto con cables ocultos o con su propio cable.** El contacto con un cable que tenga corriente hará que ésta pase a las partes metálicas descubiertas de la herramienta y que el operador reciba descargas eléctricas.
3. **Siempre que pueda, use abrazaderas o mordazas para sujetar la pieza de trabajo.**
4. **Utilice siempre anteojos de seguridad o protección ocular al utilizar la sierra multiuso.** Los anteojos comunes poseen sólo lentes resistentes a los impactos; estos anteojos no son anteojos de seguridad. Si sigue esta instrucción, reducirá el riesgo de una descarga eléctrica, incendio o lesiones personales serias.
5. **Utilice protección auditiva durante períodos extensos de utilización de la herramienta.** Si sigue esta instrucción, reducirá el riesgo de una descarga eléctrica, incendio o lesiones personales serias.
6. **Mantenga las manos alejadas del área de corte.** No ponga la mano debajo del material que se está cortando ya que no podrá ver la proximidad de la hoja a su mano.
7. **No utilice hojas desfiladas ni dañadas.** Una hoja doblada puede romperse fácilmente o causar retroceso.
8. **Verifique siempre las paredes y los techos para evitar caños y cables eléctricos ocultos.**
9. **Luego de largos períodos de trabajo, los accesorios y las piezas metálicas externas pueden recalentarse.**
10. **Retire la hoja del corte una vez que se haya detenido completamente.**
11. **Siempre sostenga firmemente la base contra el material a cortar para reducir la vibración de la sierra y el salto y ruptura de la hoja.**
12. **Antes de cortar compruebe que la línea de corte esté libre de clavos, tornillos, etc.**
13. **Nunca detenga la hoja de corte aplicando presión lateral sobre ella.**
14. **La sierra multiuso es una herramienta de mano. No atornille la sierra multiuso.**
15. **Extraiga el enchufe de la toma eléctrica antes de llevar a cabo cualquier reparación o ajuste.**
16. **No incinere ni queme la batería, ya que puede estallar.**
17. **No cargue baterías que no sean recargables.**
18. **Reemplace cualquier cable dañado de su cargador.**
19. **Tanto la batería como el cargador se recalentarán durante la carga; esto es normal.**
20. **Una vez que la recarga haya terminado, saque siempre la batería cargada del cargador.**
21. **No arroje las baterías.** Devuelva las baterías agotadas para su recolección local o llévelas a algún centro de reciclado.

SÍMBOLOS


Para reducir el riesgo de lesiones, el usuario deberá leer el manual de instrucciones.


Advertencia


Use protección auditiva


Use lentes de seguridad


Use máscara contra el polvo


No exponer a la lluvia ni al agua


No arrojar al fuego



Cargue siempre la batería de batería bajo emperaturas de entre 32°F(0°C) - 86°F(30°C).

DATOS TÉCNICOS

Voltios	12 V ⎓
Velocidad sin carga	2200 spm
Longitud de carrera	5/8 pulg. (16 mm)
Capacidad de corte	
Madera	2 pulg. (50 mm)
Aluminio	1-3/4 pulg. (45 mm)
Acer	5/32 pulg. (4 mm)
Peso	2.6 libras(1.2 Kg)

INSTRUCCIONES DE USO


NOTA: Antes de usar la herramienta, lea atentamente el manual de instrucciones.

PROCEDIMIENTO DE CARGA

1. CARGANDO LA BATERÍA


¡ADVERTENCIA!: El cargador y las baterías están diseñados especialmente para funcionar juntos; por lo tanto, no intente utilizar otros dispositivos. Nunca inserte o permita que objetos metálicos se introduzcan en el cargador o en las conexiones de las baterías, dado que ello provocará una falla eléctrica y situación de peligro.

2. ANTES DE UTILIZAR LA HERRAMIENTA

Su batería está DESCARGADA y debe cargarla antes de usarla. Su paquete de baterías no se estará completamente cargado hasta que haya realizado varios ciclos de carga y descarga, cargándolo y utilizando su Herramienta. Después de esto mejorará el rendimiento de la batería.

3. CÓMO CARGAR LA BATERÍA (VER FIG. A)

1) Conecte el cargador en el tomacorriente correcto. se iluminará la luz verde.
2) Introduzca la batería en el cargador, se encenderá la luz verde para indicar que se inició la carga
3) Al terminar la carga, se iluminará la luz verde. La batería está ahora completamente cargada, desconecte el cargador y retire la batería.


¡ADVERTENCIA! Si se agota la carga de la batería debido al uso continuado o la exposición a la luz solar directa o el calor, deje que la herramienta se enfríe antes de volver a cargarla para completar el nivel de carga.

4. PARA EXTRAER O INSTALAR LA BATERÍA (Ver Fig. B)
Ubique los pestillos en el costado del paquete de baterías y oprima ambos lados para sacarlo del taladro. Retire el paquete de baterías del taladro. Después de haberse cargado, insértelo en la cavidad para las baterías de su taladro. Basta con deslizarlo y ejercer una leve presión.

ADJUSTE
Esta herramienta es la combinación de una sierra de vaivén y sierra reciprocante, que se activa a través del interruptor deslizante de liberación de rotación (4). Levante el interruptor deslizante de liberación de rotación por completo hasta que no se pueda levantar más. (Ver Fig. C)
Gire la parte frontal de la herramienta a una de las SEIS posiciones (0, 18, 36, 54, 72 y 90 grados) (Ver Fig. D). Vuelva a colocar en su posición el interruptor deslizante de liberación de rotación.
En la posición I(0 grados), se puede utilizar esta herramienta como una sierra reciprocante.
En la posición VI(90 grados), se puede utilizar esta herramienta como una sierra de vaivén.

¡ADVERTENCIA!
Al ajustar la herramienta, sólo puede sostener la zapata como se muestra en la Fig. E1. Nunca sostenga la cabeza giratoria como se muestra en la Fig. E2, E3.

¡ADVERTENCIA!
- Para evitar pellizcos, mantenga los dedos lejos de la bisagra al cambiar posiciones.
- A fin de evitar que la herramienta se encienda de forma accidental, extraiga la batería.

INSTALACIÓN Y EXTRACCIÓN DE LA HOJA
Extraiga el enchufe de la toma eléctrica antes de llevar a cabo cualquier reparación o ajuste.
La hoja debe extenderse más allá de la zapata y el espesor de la pieza de trabajo durante el corte. Seleccione la hoja más adecuada para el material que desee cortar y utilice la hoja más corta apropiada para el espesor del material.

¡ADVERTENCIA!Riesgo de corte. Es posible que la hoja se rompa si ésta no se extiende más allá de la zapata y la pieza de trabajo durante el corte. Es posible que se produzca un mayor riesgo de lesiones personales y también de daños en la zapata y la pieza de trabajo.
PRECAUCIÓN: Mantenga las manos alejadas del interruptor de destrabado para evitar una activación del gatillo antes de realizar cualquier ajuste o extraer o instalar accesorios.

---COLOCACIÓN DE LA HOJA (VER FIG. F-H)
Los dientes de la hoja son muy filosos, use guantes al cambiar la hoja. Mantenga las manos alejadas del área de corte.
Puede usar únicamente el tipo de hojas con vástagos en T mostrado en la Fig F.
Esta herramienta incluye un soporte de hoja (7) que no requiere herramientas. Esto permite un cambio fácil y rápido de la hoja de sierra sin utilizar herramientas adicionales.
Para abrir el soporte de la hoja gire el aro en sentido contra horario y manténgalo en esa posición. Luego inserte la hoja completamente en la ranura del soporte con los dientes mirando hacia adelante y suelte el aro, el que girará y se ajustará por encima de la hoja. (Ver Fig. G1&G2)

---RETIRAR UNA HOJA
Para retirar una hoja, sosténgala y gire el aro del soporte en sentido contra horario, luego saque la hoja (podría ser eyectada por un resorte).

¡ADVERTENCIA! La hoja saldrá impulsada por un resorte. Use Protección ocular al sacar la hoja.
NOTA: Al utilizar el MODO DE SIERRA DE VAIVÉN, los dientes de la hoja apuntan hacia delante, tal como se muestra en la Fig. H.

USO

¡ADVERTENCIA! Siempre utilice protección para los ojos durante la operación de esta herramienta o cualquier otra herramienta eléctrica.

¡ADVERTENCIA!Riesgo de quemaduras. No toque la hoja inmediatamente después de usarla. El contacto con la hoja puede ocasionar lesiones personales.
Antes de comenzar a trabajar, asegúrese de que el material que desea cortar esté rígido. Las piezas de trabajo pequeños deben fijarse en forma segura con abrazaderas a la mesa de trabajo.

1. LLAVE DE ENCENDIDO/APAGADO DE SEGURIDAD (VER FIG. I)
Para encender la herramienta, oprima el botón de bloqueo (2) y luego oprima el interruptor de encendido/apagado (1). Al soltar el disparador se APAGA el motor.

Esta herramienta no permite bloquear el interruptor en la posición de ENCENDIDO y nunca debe bloquearse en esta posición de ninguna otra forma.

2. ÁREAS DE AGARRE
Asegúrese siempre de mantener una firme empuñadura mientras opera su sierra.

3. BARRA DE SEGURIDAD DE LA HOJA
Está situada delante del soporte de la hoja. Cuando la máquina se encuentra en funcionamiento, ayuda a prevenir el contacto accidental con la hoja en movimiento.

4. LUZ DEL TRABAJO(VER FIG. G1)
Hay una luz (8) incorporada en la parte delantera de la hoja. La luz se encenderá automáticamente cada vez que se oprima el interruptor de encendido/apagado.

5. CORTE
¡ADVERTENCIA! Siempre utilice protección para los ojos durante la operación de esta herramienta o cualquier otra herramienta eléctrica.
¡ADVERTENCIA!
• Nunca sostenga la cabeza giratoria al utilizar la herramienta.
Antes de cortar cualquier tipo de material, verifique que esté firmemente anclado o sujeto con abrazaderas para evitar que se resbale. Sostener la pieza de trabajo con la mano o contra el cuerpo no brinda la estabilidad requerida y puede llevar a la pérdida del control.
• Coloque la hoja con escasa presión contra el trabajo que desee cortar, oprima el interruptor disparador y permita que ésta alcance la máxima velocidad antes de aplicar presión.
• Siempre que sea posible, la zapata de la sierra debe sujetarse firmemente contra el material que se está cortando. Esto evitará que la sierra salte o vibre y minimizará el daño a la hoja. Cualquier corte que aplique presión sobre la hoja, como cortes angulares o calados, incrementa la posibilidad de vibración, retroceso y ruptura de hojas.
¡ADVERTENCIA!Riesgo de descarga eléctrica. Tenga especial cuidado al cortar en lugares altos y preste mucha atención a los cables altos que puedan estar ocultos.

¡ADVERTENCIA!Tenga mucha precaución al realizar cortes a una altura superior a la cabeza y prevea el trayecto de la caída de las ramas y los desechos con anticipación.
¡ADVERTENCIA!Inspeccione el sitio de trabajo en busca de cañerías de gas, cañerías de agua o cables eléctricos ocultos antes de realizar cortes a ciegas o rebajados. Si no cumple con esta indicación, podrían producirse explosiones, daños en la propiedad, descargas eléctricas o lesiones personales graves.

SUGERENCIAS DE TRABAJO PARA SU HERRAMIENTA

Si su herramienta eléctrica se calienta demasiado, ajuste la velocidad al máximo y hágalo funcionar sin carga por 2-3 minutos para enfriar el motor.

GENERAL
Utilice siempre una hoja adecuada al material y al grosor del material a ser cortado.
Asegúrese siempre de que la pieza de trabajo esté firmemente afianzada para prevenir el movimiento.
Para mayor control, utilice baja velocidad al comenzar a cortar y después auméntela hasta lograr la velocidad correcta. Cualquier movimiento del material puede afectar la calidad del corte. La hoja corta en movimiento ascendente y puede astillar la superficie superior. Cerciórese de que la superficie superior no sea una superficie visible cuando el trabajo esté terminado.

MANTENGA LAS HERRAMIENTAS CON CUIDADO

Su herramienta no requiere lubricación ni mantenimiento adicional. No posee piezas en su interior que puedan ser reparadas por el usuario. Nunca emplee agua o productos químicos para limpiar su herramienta. Use simplemente un paño seco. Guarde siempre su herramienta en un lugar seco. Mantenga limpias las ranuras de ventilación del motor. La observación de chispas que destellan bajo las ranuras de ventilación, indica operación normal que no dañará su herramienta.

SOLUCIÓN DE PROBLEMAS

Problema	Causa posible	Solución posible
La herramienta se detiene de forma repentina durante su uso.	Sobrecarga Temperatura de la batería demasiado alta Capacidad baja de la batería	Libere inmediatamente la carga de la herramienta y espere a que se enfríe durante aproximadamente 30 segundos a la velocidad más alta sin carga. Cargando la Batería

DECLARACIÓN DE GARANTÍA DE 2 AÑOS

Si su herramienta Rockwell presenta algún problema derivado de un defecto de materiales o mano de obra durante un periodo de 2 años a partir de la fecha de compra, se garantiza:

- La sustitución o reparación sin cargo de todas las piezas defectuosas.
- La reparación de todos los productos sin cargo, o
- La sustitución de la unidad sin cargo por una nueva o reacondicionada.

La garantía se encuentra sujeta a las siguientes condiciones:

- Las baterías poseen una garantía de sólo 12 meses.
- El producto no debe haber sido sometido a mal uso, abuso, negligencia, alteración, modificación o reparación por parte de cualquier entidad ajena a la red de centros de asistencia autorizados.
- Deben haberse utilizado únicamente piezas y accesorios originales de Rockwell Shop Series en el producto o en conjunto con el mismo.
- El problema no debe ser producto del desgaste y deterioro naturales.
- No se utilizó la herramienta para fines de alquiler.
- El producto no debe haber recibido daños provocados por objetos extraños, sustancias de cualquier tipo o accidentes.

Su garantía no cubre:

- Aquellos componentes sometidos al desgaste y deterioro naturales derivados de su funcionamiento de acuerdo con las instrucciones de uso.
- Se excluyen de esta garantía la manipulación o mantenimiento no autorizado o incorrecto de la herramienta, así como los accesorios como bombillas, hojas, brocas, etc.

Si desea realizar una reclamación, póngase en contacto con la línea de asistencia de Rockwell. Deberá enviar una prueba de compra en forma de recibo válido de venta en el que figure la fecha y el lugar de compra. Es posible que solicitemos que se envíe la herramienta con un franqueo prepago al centro de asistencia autorizado, junto con todos los accesorios originales.

Línea de asistencia de Rockwell 866-514-ROCK (7625)

Esta declaración de garantía no sustituye sus derechos legales, sino que los complementa.
Esta garantía no es aplicable a los accesorios suministrados con la herramienta.
Esta garantía solo es aplicable al comprador original y no puede ser transferida.
Todas las reparaciones y sustituciones de productos quedarán cubiertas un periodo de garantía limitada equivalente al periodo de garantía restante desde la fecha de compra original.

Garantía limitada de reemplazo por 30 Días

Durante los primeros 30 días luego de la fecha de compra, podrá reemplazar una herramienta que no funcione correctamente debido a defectos de material o fabricación devolviéndola a la tienda donde la haya comprado. Para recibir una herramienta de reemplazo, deberá presentar un comprobante de compra fechado y devolver todo el material de empaque original junto con el producto.
La herramienta reemplazada seguirá cubierta por una garantía limitada basada en el balance de el periodo de dos años desde la fecha original de la compra.

LISTE DES ÉLÉMENTS

1. DÉTENTE DE L'INTERRUPTEUR MARCHE-ARRÊT
2. BOUTON DE VERROUILLAGE
3. ZONES DE PRÉHENSION
4. BOUTON COULISSANT DE DÉGAGEMENT DU MÉCANISME DE PIVOTEMENT
5. CAPOT DU MOTEUR
6. BARRE DE SÉCURITÉ
7. SERRE LAME MANUEL
8. TÉMOIN DEL (VOIR FIG. G1)
9. SEMELLE
10. PLAQUE DE BASE
11. MÉCANISME DE RETENUE DU BLOC-PILES
12. BLOC-PILES *
13. CHARGEUR (VOIR FIG. A)*
14. CHARGE TÉMOIN LUMINEUX (VOIR FIG. A)
15. LAME DE SCIE (VOIR FIG. F)

*** Les accessoires illustrés ou décrits ne sont pas tous compris dans le cadre de la livraison standard.**

ACCESSOIRES

RK2518

Lame métallique	1
Lame pour bois	1

RK2518K

30 min chargeur (RW9400)	1
1.3 Ah batterie au lithium (RW9300)	1
Lame métallique	1
Lame pour bois	1

Utilisez seulement le type de lames à queue en T montré à la Figure F.

Nous vous recommandons d'acheter tous vos accessoires du même magasin qui vous a vendu l'outil. N'utilisez que des accessoires de bonne qualité de marque renommée. Choisissez le type d'outil approprié au travail que vous désirez entreprendre. Pour de plus amples renseignements, consultez l'emballage de l'accessoire. Le personnel du magasin peut également vous conseiller.

AVERTISSEMENTS GENERAUX CONCERNANT LA SECURITE DES OUTILS ELECTRIQUES

AVERTISSEMENT! Lisez et assimilez toutes les instructions. Le non-respect des instructions ci-après peut entraîner un risque de choc électrique, d'incendie et/ou de blessures graves.

Conservez tous les avertissements et instructions pour pouvoir les consulter ultérieurement.

L'expression « outil électrique » dans tous les avertissements énumérés ci-dessous se réfère à votre outil électrique fonctionnant sur secteur (branché) ou à batterie (sans-fil).

1. AIRE DE TRAVAIL

a) Veillez à ce que l'aire de travail soit propre et bien éclairée. Le désordre et le manque de lumière favorisent les accidents.

b) N'utilisez pas d'outils électriques dans un milieu présentant un risque d'explosion, par exemple en présence de liquides, de gaz ou de poussières inflammables. Les outils électriques créent des étincelles qui pourraient enflammer les poussières ou les vapeurs.

c) Gardez à distance les curieux, les enfants et les visiteurs lorsque vous travaillez avec un outil électrique. Ils pourraient vous distraire et vous faire faire une fausse manoeuvre.

2. SÉCURITÉ ÉLECTRIQUE

a) Les fiches des outils électriques doivent correspondre aux prises murales. Ne jamais modifier la fiche de quelque façon que ce soit. Ne pas utiliser de fiches d'adaptation avec des outils électriques mis à la terre (mis à la masse). Des fiches non modifiées et des prises qui leur correspondent réduiront le risque de choc électrique.

b) Évitez tout contact corporel avec des surfaces mises à la terre (tuyauterie, radiateurs, cuisinières, réfrigérateurs, etc.). Le risque de choc électrique est plus grand si votre corps est en contact avec la terre.

c) N'exposez pas les outils électriques à la pluie ou à l'eau. La présence d'eau dans un outil électrique augmente le risque de choc électrique.

d) Ne maltraitez pas le cordon. Ne transportez jamais l'outil par son cordon et ne débranchez jamais la fiche en tirant sur le cordon. N'exposez pas le cordon à la chaleur, à des huiles, à des arrêtes vives ou à des pièces en mouvement. Un cordon endommagé augmente le risque de choc électrique.

e) Quand vous utilisez un outil électrique à l'extérieur, utilisez une rallonge qui convient à un usage à l'extérieur. Ces cordons sont prévus pour être utilisés à l'extérieur et pour réduire le risque de choc électrique.

f) Si l'utilisation d'un outil électrique dans un endroit humide est inévitable, utilisez une alimentation protégée par un disjoncteur de fuite de terre (GFCI). L'utilisation d'un GFCI réduit les risques d'électrocution.

3. SÉCURITÉ DES PERSONNES

a) Restez alerte, concentrez-vous sur votre travail et faites preuve de bon sens. N'utilisez pas un outil électrique si vous êtes fatigué ou sous l'influence de drogues, d'alcool ou de médicaments. Un instant d'inattention lors de l'utilisation d'outils électriques peut entraîner des blessures graves.

b) Utilisez des accessoires de sécurité. Portez toujours une protection oculaire. De l'équipement de sécurité tel que le masque antipoussière, les chaussures de sécurité antidérapantes, des casques durs ou des protections antibruit utilisés dans des conditions appropriées réduiront les blessures corporelles.

c) Évitez les démarrages accidentels. Avant d'insérer la batterie dans l'outil, assurez-vous que son interrupteur est en position « OFF » (Arrêt) ou verrouillée. Le fait de transporter un outil avec le doigt sur la détente/l'interrupteur ou d'insérer la batterie dans un outil dont la détente est en position « ON » (Marche) peut causer un accident.

d) Retirer les clés de réglage avant de mettre l'outil sous tension. Une clé restée attachée à une partie mobile de l'outil pourrait entraîner des blessures corporelles.

e) Ne vous penchez pas trop en avant. Maintenez un bon appui et restez en équilibre en tout temps. Une bonne stabilité vous permet de mieux réagir à une situation inattendue.

f) **Habillez-vous convenablement. Ne portez ni vêtements flottants ni bijoux. Gardez les cheveux, les vêtements et les gants éloignés des pièces en mouvement.** Les vêtements flottants, les bijoux ou les cheveux longs risquent d'être happés par des pièces en mouvement.

g) **Si un sac de récupération de la poussière est fourni avec un connecteur pour aspirateur, assurez vous qu'il est correctement relié et utilisé de façon appropriée.** L'utilisation de ce système réduit les dangers physiques et physiologiques liés à la poussière.

4. UTILISATION ET ENTRETIEN DE L'OUTIL

a) **Ne forcez pas l'outil. Utilisez l'outil approprié à la tâche.** L'outil approprié fonctionne mieux et de façon plus sécuritaire. Respectez aussi la vitesse de travail qui lui est propre.

b) **N'utilisez pas un outil si l'interrupteur ne le met pas en marche ou ne peut l'arrêter.** Un outil qui ne peut être contrôlé par l'interrupteur est dangereux et doit être réparé.

c) **Débranchez la batterie de l'outil ou mettez son interrupteur en position « OFF » (Arrêt) ou « LOCKED » (Verrouillé) avant d'effectuer un réglage, de changer d'accessoire ou de ranger l'outil.** De telles mesures de sécurité préventive réduisent le risque de démarrage accidentel de l'outil.

d) **Rangez les outils hors de portée des enfants et d'autres personnes inexpérimentées.** Les outils sont dangereux dans les mains d'utilisateurs novices.

e) **Prenez soin de bien entretenir les outils. Soyez attentif à tout désalignement ou coincement des pièces en mouvement, à tout bris ou à toute autre condition préjudiciable au bon fonctionnement de l'outil. Si vous constatez qu'un outil est endommagé, faites-le réparer avant de vous en servir.** De nombreux accidents sont causés par des outils en mauvais état.

f) **Les outils de coupe doivent être toujours bien affûtés et propres.** Des outils bien entretenus, dont les arêtes sont bien tranchantes, sont moins susceptibles de se coincer et plus faciles à contrôler.

g) **Utilisez l'outil électrique, les accessoires et les forets etc., en conformité avec ces instructions et de la manière conçue pour le type particulier d'outil électrique, prend en compte les conditions de travail et le travail qui doit être accompli.** L'emploi de l'outil électrique pour des opérations différentes de celles pour lesquelles il a été conçu pourrait entraîner une situation dangereuse.

h) Inférieur dont la température et l'humidité soient contrôlabes pour éviter le polluant électrique,et fixer les pièces à raffiner sur une table stable avec pince ou par d'autres façons.

i) Les opération comme fixation des pièces à raffiner par main ou contre le corps soient conduire à une déstabilisation, et peut-être un dérapage.

5. UTILISATION DE LA BATTERIE ET ENTRETIEN

a) **Un outil à batterie avec batteries incorporées ou une batterie séparée doit être rechargé uniquement avec le chargeur indiqué pour la batterie.** Un chargeur qui peut être adéquat pour un type de batterie peut créer un risque d'incendie lorsqu'il est utilisé avec une autre batterie.

b) **Utiliser un outil à batterie uniquement avec la batterie désignée.** L'emploi de toute autre batterie peut créer un risque d'incendie.

c) **Lorsque la batterie n'est pas utilisée, tenez-la à l'écart d'autres objets métalliques tels que trombones, pièces de monnaie, clés, clous, vis ou autres petits objets métalliques susceptibles d'établir une connexion d'une borne à une autre.** Le court-circuitage des bornes de batterie peut causer des étincelles, des brûlures, une explosion ou un incendie.

d) **Dans le cadre de conditions d'abus, du fluide peut être éjecté de la batterie, évitez tout contact. Si un contact se produisait accidentellement, rincez abondamment avec de l'eau.** Si le fluide touche les yeux, cherchez en plus de la mesure précédente de l'aide médicale. Le fluide éjecté de la batterie peut causer des irritations ou des brûlures.

6. ENTRETIEN

a) **Ayez votre outil électrique entretenu par un réparateur agréé n'utilisant que des pièces de rechange identiques.** Cela assurera que la sécurité de l'outil électrique est maintenue.

AVERTISSEMENT! Certaines des poussières produites en utilisant des outils électriques sont considérées par l'État de Californie comme susceptibles de provoquer le cancer, des anomalies congénitales et d'autres problèmes de reproduction. Voici des exemples de ces produits chimiques :

- **Plomb issu de peinture à base de plomb.**
- **Silice cristalline issue de briques et du ciment et autres produits de maçonnerie.**
- **Arsenic et chrome issus de bois traité chimiquement.**

Votre risque de ces expositions varie en fonction de la fréquence à laquelle vous effectuez ce travail. Pour réduire votre exposition à ces produits chimiques : Travaillez dans une zone bien ventilée. Portez un équipement de sécurité approuvé, tel que des masques antipoussières spécialement conçus pour éliminer les particules microscopiques par filtrage.

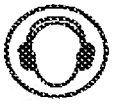
INSTRUCTIONS SUPPLÉMENTAIRES CONCERNANT LA SÉCURITÉ DE VOTRE OUTIL

1. **Toujours porter un masque anti-poussière.**
2. **Lors de l'exécution d'une opération au cours de laquelle l'outil de coupe peut venir en contact avec les fils cachés ou son propre cordon, tenez l'outil par ses surfaces isolées de préhension.** Le contact avec un fil sous tension rendra les pièces métalliques exposées de l'outil sous tension et causera des chocs à l'opérateur.
3. **À chaque fois que c'est possible, utilisez un étrier ou un étau pour tenir la pièce à travailler.**
4. **Veuillez porter en permanence des lunettes de sécurité ou des protections oculaires lorsque vous utilisez cette ponceuse polyvalente.** Les lunettes de vue ont des verres résistant aux impacts, mais ce ne sont pas des verres de sécurité. Si vous suivez ces règles, vous réduirez les risques de choc électrique, d'incendie ou des blessures graves.
5. **Veuillez porter une protection pour les oreilles durant des périodes prolongées de travail.** Si vous suivez ces règles, vous réduirez les risques de choc électrique, d'incendie ou des blessures graves.
6. **Gardez les mains à l'écart de la zone de coupe.** Ne placez surtout pas la main sous le matériau que vous coupez. Il est impossible de déterminer exactement la proximité de la lame de votre main.
7. **N'utiliser pas de lames émoussées ou endommagées.** Les lames pliées peuvent aisément se fracturer ou causer un rebond.
8. **Toujours vérifier les murs, les sols et les plafonds afin de découvrir d'éventuels câbles électriques et tuyaux cachés.**
9. **Après de longues périodes de travail, les parties externes métalliques et les accessoires pourraient être chauds.**
10. **Retirer la lame de la coupe uniquement après qu'elle se soit arrêtée.**
11. **La plaque de base de l'outil doit toujours être maintenue fermement contre le matériau découpé (pour réduire les vibrations de la scie, les sauts de lame et les cassures).**
12. **Avant d'effectuer la coupe, vérifier qu'il n'y a pas de clous, vis ou autres sous la ligne de coupe**
13. **Ne jamais arrêter la lame en y exerçant une pression latérale.**
14. **Votre scie polyvalente est un outil à main, ne fixez pas la scie polyvalente dans un étau.**
15. **Retirez la prise de la prise murale avant d'effectuer n'importe quel travail de réglage, de réparation ou d'entretetien.**
16. **Ne pas incinérer ou brûler la pile, elle pourrait exploser.**
17. **Ne pas recharger une pile endommagée.**
18. **Ne pas recharger des piles non rechargeables.**
19. **Il est normal que la pile et le chargeur soient chauds pendant le chargement.**
20. **Toujours retirer la batterie du chargeur immédiatement après que celle-ci est rechargée.**
21. **Ne jetez pas les piles au rebut.** Retournez les au service de recyclage ou de collecte de votre localité.

SYMBOLES


Afin de réduire les risques de blessure, l'utilisateur doit lire ce mode d'emploi.


Avertissement


Portez une protection auditive


Portez un protecteur oculaire


Portez un masque antipoussières


Ne pas exposez pas à la pluie et à l'eau


Ne pas jeter au feu



Rechargez toujours la pile dans les limites de température ambiante de 32°F(0°C) et 86°F(30°C).

DONNÉES TECHNIQUES

Tension		12 V ⎓
Vitesse à vide		2200 spm
Course		16 mm(5/8 po)
Épaisseur maximale de coupe		
	Bois	50 mm (2 po)
	Aluminium	45 mm (1-3/4 po)
	Métaux	4 mm (5/32 po)
Poids		1.2 Kg (2.6 lbs)

INSTRUCTIONS D'UTILISATION

REMARQUE: Avant d'utiliser cet outil, assurez-vous de lire attentivement le manuel d'utilisation.

PROCEDURE DE CHARGEMENT

1. PILE EN RECHARGE

AVERTISSEMENT: Le chargeur et la batterie sont spécifiquement conçus pour être utilisés ensemble, ne faites pas usage d'autres articles. N'insérez jamais d'objets métalliques et ne laissez pas non plus de tels objets entrer en contact avec les bornes de la batterie/chargeur. Ceci est dangereux et entraînera une panne du chargeur.

2. AVANT D'UTILISER VOTRE PONCEUSE

Votre bloc-pile n'est PAS CHARGÉ. Il faut donc le rechargeur une fois avant d'utiliser l'outil. Le bloc-piles de votre torche n'atteindra sa pleine capacité que lorsque vous aurez effectué quelques cycles de décharge/recharge de ponceuse. La performance de la pile s'améliorera après ces décharges et recharges consécutives.

3. COMMENT RECHARGEUR LE BLOC-PILE (VOIR FIG. A)

1) Brancher le chargeur sur une prise appropriée. sa lumière verte s'allumera.
2) Insérer le bloc-pile dans le chargeur, la lampe témoin rouge s'allume pour indiquer le début de la charge
3) À la fin du chargement, sa lumière verte s'allumera. Le bloc-pile est alors entièrement chargé; débrancher le chargeur et retirer le bloc-pile.

AVERTISSEMENT: Lorsque la charge de la batterie s'épuise après une utilisation continue ou l'exposition directe à la lumière du soleil ou à une source de chaleur, laissez à l'outil le temps de refroidir avant de recharger

la batterie en entier.

4. RETRAIT/RÉINSTALLATION DU BLOC-PILE (VOIR Fig. B)
Repérez les verrous sur les côtés du bloc-pile et appuyez des deux verrous pour dégager le bloc-pile de la perceuse. Retirez le bloc-pile Après l'avoir rechargé, réinsérez le dans son emplacement sur la perceuse. Une simple pression d'insertion sera suffisante.

RÉGLAGE
Cet outil fonctionne comme une scie sauteuse ou une scie alternative, en débloquant le levier de verrouillage (4).
Soulevez complètement le levier de verrouillage jusqu'à la butée. (VOIR Fig. C)
Tournez la partie avant de l'outil dans l'une des SIX positions (0, 18, 36, 54, 72 et 90 degrés) (VOIR Fig. D).
Replacez le levier de verrouillage.
En position I (0 degrés), cet outil peut être utilisé comme une scie alternative.
En position VI (90 degrés), cet outil peut être utilisé comme une scie sauteuse.

AVERTISSEMENT!
Lors du réglage de l'outil, tenez la plaque de base comme indiqué dans la Fig. E1. Ne tenez jamais la tête pivotante comme illustré dans les Fig. E2, E3.

AVERTISSEMENT!
- Pour éviter tout pincement, tenir les mains éloignées de la charnière au moment de changer de position.
- Pour éviter la mise en marche accidentelle de l'outil, enlevez le bloc-piles.

INSTALLATION ET DÉPOSE DE LA LAME
Retirez la prise de la prise murale avant d'effectuer n'importe quel travail de réglage, de réparation ou d'entretetien.
La lame doit dépasser la semelle et l'épaisseur de la pièce au cours de la coupe. Sélectionner la lame qui convient le mieux au matériau à couper et utiliser la lame la plus courte possible adéquate pour l'épaisseur du matériau.
AVERTISSEMENT! Risque de coupure. Un bris de lame est possible si la lame ne dépasse pas la semelle et la pièce en cours de coupe. Il peut en résulter un risque accru de blessures corporelles et de dommages à la semelle et à la pièce.
ATTENTION: Gardez vos mains loin du bouton de verrouillage pour éviter une mise en marche accidentelle avant d'effectuer un réglage ou de retirer ou d'installer des accessoires.

---POUR INSÉRER UNE LAME DANS LA SCIE (VOIR FIG. F-H)
Les dents de la lame sont très coupantes, portez des gants lors du remplacement de lame. Gardez les mains à l'écart de la zone de coupe.
Utilisez seulement le type de lames à queue en T montré à la Figure F.
L'appareil est équipé d'un porte-lame sans outil (7). Ceci permet d'effectuer facilement et rapidement un changement de la lame sans outil supplémentaire.
Pour ouvrir le porte-lame faîtes pivoter l'anneau dans le sens contraire des aiguilles d'une montre et gardez la position. Puis insérez entièrement la lame dans la fente du porte-lame avec les dents tournées vers l'avant et relâchez l'anneau, qui tournera de lui-même et se fixera sur le haut de la lame. (VOIR Fig. G1&G2)

---POUR DÉPOSER LA LAME DE LA SCIE
Pour retirer une lame, tenez la lame et faîtes pivoter l'anneau du porte-lame dans le sens inverse des aiguilles d'une montre puis sortir la lame.
AVERTISSEMENT!la lame est poussée par un ressort. Lors de remplacements de lames, portez également des lunettes de sécurité pour protéger vos yeux.
REMARQUE : Lorsque vous utilisez l'outil en mode scie sauteuse, les dents de la scie sont dirigées vers l'avant comme sur la Fig. H.

FONCTIONNEMENT
AVERTISSEMENT: Toujours porter une protection oculaire durant l'utilisation de cet outil électrique ou tout autre outil électrique.
AVERTISSEMENT: Risque de brûlure. Ne pas toucher la lame immédiatement après usage. Un contact avec la lame risque de provoquer une blessure corporelle.
Avant de débuter la coupe, s'assurer que le matériau est bien rigide. Les petites pièces doivent être solidement fixées à une table de travail.

1. INTERRUPTEUR MARCHE/ARRÊT DE SÉCURITÉ (VOIR FIG. I)
Pour mettre l'outil en marche, appuyer sur le bouton de verrouillage (2), puis enfoncer l'interrupteur marche/arrêt (1). Relâcher la détente et le moteur s'arrête.

Cet outil n'est doté d'aucun dispositif permettant de verrouiller l'interrupteur à la position de MARCHE ; il ne doit donc jamais être verrouillé à cette position par quelque moyen que ce soit.

2. ZONE DE PRÉHENSION
Assurez-vous toujours d'avoir une prise ferme lors du fonctionnement de la scie sauteuse.

3. BARRE DE SÉCURITÉ
Située sur l'avant du porte-lame, elle permet, pendant le travail, d'éviter tout contact accidentel avec la lame en mouvement.

4. TÉMOIN DEL(VOIR FIG. G1)
Une lampe est intégrée à l'avant de la scie. Le système d'éclairage s'allumera automatiquement chaque fois que l'interrupteur marche/arrêt sera enfoncé.

5. COUPE
AVERTISSEMENT: Toujours porter une protection oculaire durant l'utilisation de cet outil électrique.

AVERTISSEMENT:
• Ne tenez jamais la tête du pivot lorsque vous utilisez l'outil.
Avant de couper tout matériau, s'assurer que ce dernier est bien ancré ou serré dans un étau pour éviter tout glissement. Tenir la pièce avec la main ou contre son corps n'est pas suffisamment stable et risque de provoquer une perte de maîtrise de l'outil.
• Appuyer légèrement la lame contre la pièce à couper, puis appuyer sur la détente et laisser l'outil atteindre la vitesse maximale avant d'exercer une pression.
• En autant que possible, la semelle de la scie doit être solidement appuyée contre le matériau à couper. Cela évite tout écart ou vibration de la scie et réduira le bris de lame. Toute coupe qui exerce une pression sur la lame, telle une coupe angulaire ou défilante, augmente le risque de vibration, d'effet de rebond et de bris de lame.

AVERTISSEMENT: Risque de choc électrique. être très prudent pour effectuer une coupe au-dessus de la tête et porter une attention accrue aux fils en hauteur pouvant être cachés.

AVERTISSEMENT: être très prudent pour une coupe au dessus de la tête et prévoir la direction de la chute des branches et des débris.

AVERTISSEMENT: Inspecter la zone de travail pour tout tuyau à gaz, conduites d'eau ou fils électriques cachés avant d'effectuer des coupes sans visibilité ou en plongée. Négliger de suivre ces directives pourrait provoquer une explosion, des dommages matériaux, un choc électrique et/ou de graves blessures corporelles.

TRUCS POUR UTILISER VOTRE PONCEUSE

Si votre outil motorisé devient trop chaud, réglez la vitesse au maximum et opérez le à vide durant 2 à 3 minutes pour refroidir le moteur.

GÉNÉRALITÉS
Utilisez toujours une lame adaptée au matériau et à son épaisseur.
Assurez-vous que l'ouvrage est fermement maintenu ou fixé pour empêcher tout déplacement.
Tout déplacement du matériau pourrait affecter la qualité de la coupe. La lame coupe sur la course vers le haut et pourrait écailler la partie supérieure.
Assurez-vous que la surface supérieure ne sera pas visible lorsque le projet sera terminé.

PRENEZ SOIN DE VOS OUTILS ET ENTRETENEZ LES BIEN

Votre outil ne nécessite aucune lubrification ou entretien supplémentaire.
Il ne comporte aucune pièce à réparer ou à entretenir par l'utilisateur. N'utilisez jamais de l'eau ou des nettoyants chimiques pour nettoyer l'outil. Essuyez-le avec un chiffon sec. Rangez toujours votre outil dans un endroit sec. Gardez propres les ouvertures de ventilation du moteur. Si vous remarquez des étincelles dans les ouvertures de ventilation, ceci est normal et n'endommagera pas votre outil.

DÉPANNAGE

Problème	Cause possible	Solution possible
L'outil s'arrête soudainement en cours de fonctionnement.	Surcharge de l'outil Température de la batterie trop élevée Batterie faible	Soulagez immédiatement la charge sur l'outil et laissez-le refroidir pendant environ 30 secondes en le laissant fonctionner à pleine vitesse à vide Rechargez la batterie.

DÉCLARATION DE GARANTIE DE 2 ANS

Si votre outil Rockwell devient défectueux suite à un défaut de matériaux ou de fabrication dans un délai de 2 ans à compter de la date d'achat, nous garantissons que nous:

- Remplacerons ou réparerons toutes les pièces défectueuses, sans aucun frais, ou.
- Réparerons les produits gratuitement, ou.
- Remplacerons l'appareil avec un neuf ou une nouvelle unité reconditionnée, gratuitement.

La garantie est soumise aux conditions suivantes:

- Les batteries sont garanties pour une période de 12 mois seulement.
- Le produit n'a pas été mal utilisé, maltraités, négligé, altéré, modifié ou réparé par quelqu'un d'autre qu'un centre de service agréé.
- Seulement des accessoires et pièces Rockwell d'origine ont été utilisés sur ou avec le produit
- Le produit a été soumis à une usure normale.
- Le produit n'a pas été utilisé pour des locations.
- Le produit n'a pas subi de dommages par des objets étrangers, des substances ou accidents.

La garantie ne couvre pas:

- Les composants qui sont soumis à l'usure naturelle causée par l'utilisation conformément aux instructions de fonctionnement.
- Un mauvais entretien, une mauvaise manipulation, des manipulations non autorisées ou une surcharge, de plus, les accessoires tels que les ampoules, les lames et les mèches, etc. ne sont pas couverts pas la garantie.

Pour des réclamations, contacter la ligne téléphonique de Rockwell. Vous devrez présenter une preuve d'achat sous la forme d'un reçu valide qui affiche la date et le lieu d'achat.
Nous pouvons exiger l'envoi en port payé de l'outil à un centre de service autorisé, avec tous les équipements d'origine.

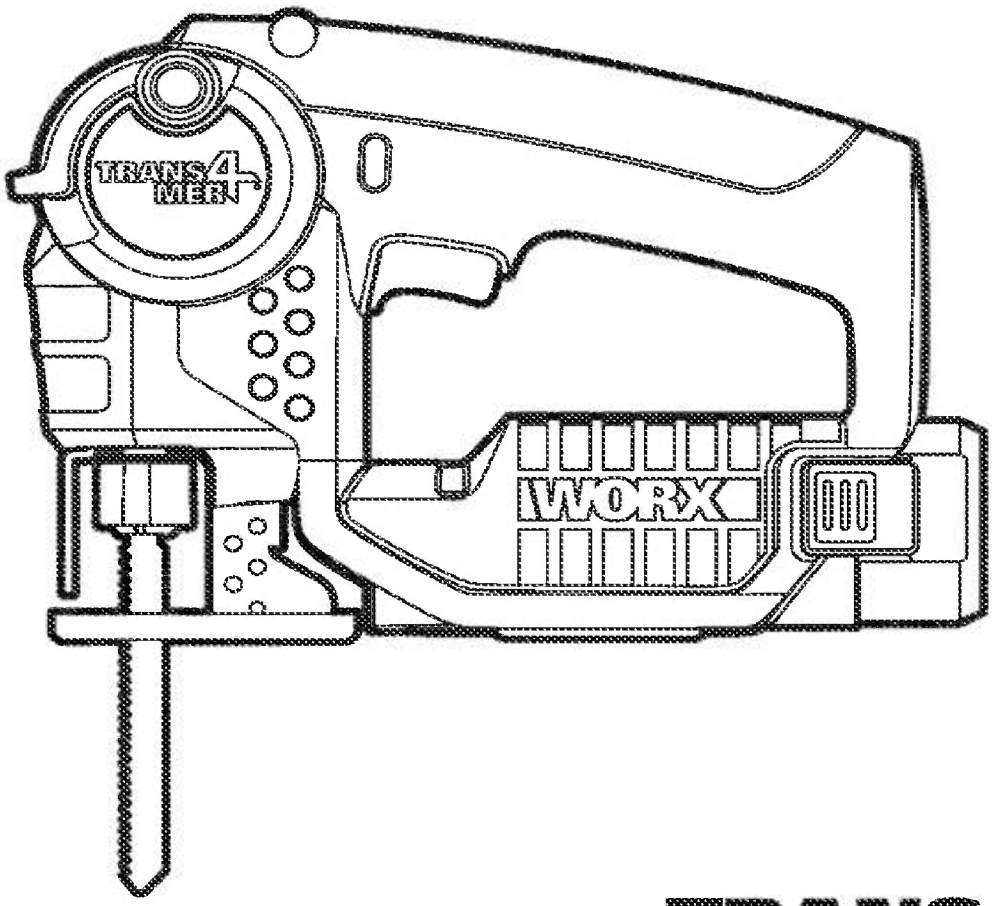
Ligne téléphonique de Rockwell 866-514-ROCK (7625)
Cette déclaration de garantie ne se substitue pas mais s'ajoute à vos droits statutaires.
Cette garantie ne s'applique pas aux accessoires fournis avec l'outil.
Cette garantie ne s'applique qu'à l'acheteur d'origine et peut ne pas être transférer.
Toutes les réparations et tous les remplacements de produit seront couverts par la garantie limitée pour le reste de la période de garantie à partir de la date d'achat initial.

Politique d'échange limitée de soixante (30) jours
Un outil qui ne fonctionne pas correctement à cause d'un défaut de pièce ou de main-d'œuvre est échangeable durant les soixante (30) premiers jours après la date d'achat en rapportant l'outil au détaillant où il a été acheté. Pour obtenir un outil de remplacement vous devez présenter une preuve d'achat datée et retourner l'outil dans son emballage original. L'outil remplacé sera couvert par la balance de la garantie limitée de deux ans.



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WORX



TRANS4MER®

SAFETY AND OPERATING MANUAL

ORIGINAL INSTRUCTIONS

12V Li-Ion **WX540**
Multi-purposed saw **WX540.3 WX540.9**

GENERAL POWER TOOL SAFETY WARNINGS

WARNING: Read all safety warnings and all instructions. Failure to follow the warnings and instructions may result in electric shock, fire and/or serious injury.

Save all warnings and instructions for future reference.
The term "power tool" in the warnings refers to your mains-operated (corded) power tool or battery-operated (cordless) power tool.

1) WORK AREA SAFETY

a) Keep work area clean and well lit. Cluttered or dark areas invite accidents.

b) Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases or dust. Power tools create sparks which may ignite the dust or fumes.

c) Keep children and bystanders away while operating a power tool. Distractions can cause you to lose control.

2) ELECTRICAL SAFETY

a) Power tool plugs must match the outlet. Never modify the plug in any way. Do not use any adapter plugs with earthed (grounded) power tools. Unmodified plugs and matching outlets will reduce risk of electric shock.

b) Avoid body contact with earthed or grounded surfaces, such as pipes, radiators, ranges and refrigerators. There is an increased risk of electric shock if your body is earthed or grounded.

c) Do not expose power tools to rain or wet conditions. Water entering a power tool will increase the risk of electric shock.

d) Do not abuse the cord. Never use the cord for carrying, pulling or unplugging the power tool. Keep cord away from heat, oil, sharp edges or moving parts. Damaged or entangled cords increase the risk of electric shock.

e) When operating a power tool outdoors, use an extension cord suitable for outdoor use. Use of a cord suitable for outdoor use reduces the risk of electric shock.

f) If operating a power tool in a damp location is unavoidable, use a residual current device (RCD) protected supply. Use of an RCD reduces the risk of electric shock.

3) PERSONAL SAFETY

a) Stay alert, watch what you are doing and use common sense when operating a power tool. Do not use a power tool while you are tired or under the influence of drugs, alcohol or medication. A moment of inattention while operating power tools may result in serious personal injury.

b) Use personal protective equipment. Always wear eye protection. Protective equipment such as dust mask, non-skid safety shoes, hard hat, or hearing protection used for appropriate conditions will reduce personal injuries.

c) Prevent unintentional starting. Ensure the switch is in the off-position before connecting to power source and/or battery pack, picking up or carrying the tool. Carrying power tools with your finger on the switch or energising power tools that have the switch on invites accidents.

d) Remove any adjusting key or wrench before turning the power tool on. A wrench or a key left attached to a rotating part of the power tool may result in personal injury.

e) Do not overreach. Keep proper footing and balance at all times. This enables better control of the power tool in unexpected situations.

f) Dress properly. Do not wear loose clothing or jewellery. Keep your hair, clothing and gloves away from moving parts. Loose clothes, jewellery or long hair can be caught in moving parts.

g) If devices are provided for the connection of dust extraction and collection facilities, ensure these are connected and properly used. Use of dust collection can reduce dust-related hazards.

4) POWER TOOL USE AND CARE

a) Do not force the power tool. Use the correct power tool for your application. The correct power tool will do the job better and safer at the rate for which it was designed.

b) Do not use the power tool if the switch does not turn it on and off. Any power tool that cannot be controlled with the switch is dangerous and must be repaired.

c) Disconnect the plug from the power source and/or the battery pack from the power tool before making any adjustments, changing accessories, or storing power tools. Such preventive safety measures reduce the risk of starting the power tool accidentally.

d) Store idle power tools out of the reach of children and do not allow persons unfamiliar with the power tool or these instructions to operate the power tool. Power tools are dangerous in the hands of untrained users.

e) Maintain power tools. Check for misalignment or binding of moving parts, breakage of parts and any other condition that may affect the power tool's operation. If damaged, have the power tool repaired before use. Many accidents are caused by poorly maintained power tools.

f) Keep cutting tools sharp and clean. Properly maintained cutting tools with sharp cutting edges are less likely to bind and are easier to control.

g) Use the power tool, accessories and tool bits etc. in accordance with these instructions, taking into account the working conditions and the work to be performed. Use of the power tool for operations different from those intended could result in a hazardous situation.

5) BATTERY TOOL USE AND CARE

a) Recharge only with the charger specified by the manufacturer. A charger that is suitable for one type of battery pack may create a risk of fire when used with another battery pack.

b) Use power tools only with specifically designated battery packs. Use of any other battery packs may create a risk of injury and fire.

c) When battery pack is not in use, keep it away from other metal objects, like paper clips, coins, keys, nails, screws or other small metal objects, that can make a connection from one terminal to another. Shorting the battery terminals together may cause burns or a fire.

d) Under abusive conditions, liquid may be ejected from the battery; avoid contact. If contact accidentally occurs, flush with water. If liquid contacts eyes, additionally seek medical help. Liquid ejected from the battery may cause irritation or burns.

6) SERVICE

a) Have your power tool serviced by a qualified repair person using only identical replacement parts. This will ensure that the safety of the power tool is maintained.

ADDITIONAL SAFETY RULES FOR YOUR TOOL

1. **Always wear a dust mask.**
2. **Hold power tool by insulated gripping surfaces, when performing an operation where the cutting accessory may contact hidden wiring.** Cutting accessory contacting a "live" wire may make exposed metal parts of the power tool "live" and could give the operator an electric shock.
3. **Use clamps or another practical way to secure and support the workpiece to a stable platform.** Holding the work by hand or against your body leaves it unstable and may lead to loss of control.
4. **Always wear safety glasses or eye shields when using the multi-purposed saw. Everyday eyeglasses have only impact-resistant lenses;**

they are NOT safety glasses. Following this rule will reduce the risk of serious personal injury.

5. **Always wear hearing protection during extended periods of operation.** Following this rule will reduce the risk of serious personal injury.
6. **Keep your hands away from cutting area.** Do not reach under the material being cut because the nearness of the blade to your hand is hidden from your sight.
7. **Do not use dull or damaged blades.** Bent blades can break easily, or cause kickback.
8. Always check walls, floors and ceilings to avoid hidden power cables and pipes.
9. After long working period, external metal parts and accessories could be hot.
10. Only withdraw the blade from the cut when the blade has stopped moving.
11. The pivoting blade foot must be held firmly against the material being cut to reduce saw vibration, blade jumping and blade breakage.
12. Before cutting, check that the cutting line is free of nails, screws, etc.
13. Never stop the cutting blade by applying side pressure to the blade.
14. Your multi-purposed saw is a hand held tool; do not clamp your multi-purposed saw.
15. Remove the battery pack from the saw before carrying out adjustments.
16. Do not incinerate or burn the battery pack, it may explode.
17. Do not charge a damaged battery pack.
18. Do not charge non-rechargeable batteries.
19. Battery pack and charger will be warm during charging, this is normal.
20. Always remove the battery pack from the charger immediately after re-charging is completed.
21. Do not dispose of batteries. Return exhausted batteries to your local collection or recycling point.

⚠ WARNING: Some dust particles created by the sawing, contain chemicals known to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:

- Lead from lead-based paints.
- Crystalline silica from bricks and cement and other masonry products.
- Arsenic and chromium from chemically treated lumber.

Your risk from these exposures varies, depending upon how often you do this type of work. To reduce your exposure to these chemicals:

- Work in a well-ventilated area.
- Work with approved safety equipment, such as those dust masks that are specially designed to filter microscopic particles.

SYMBOLS



To reduce the risk of injury, user must read instruction manual



Warning



Wear eye protection



Wear ear protection



Wear dust mask



Do not expose to rain or water



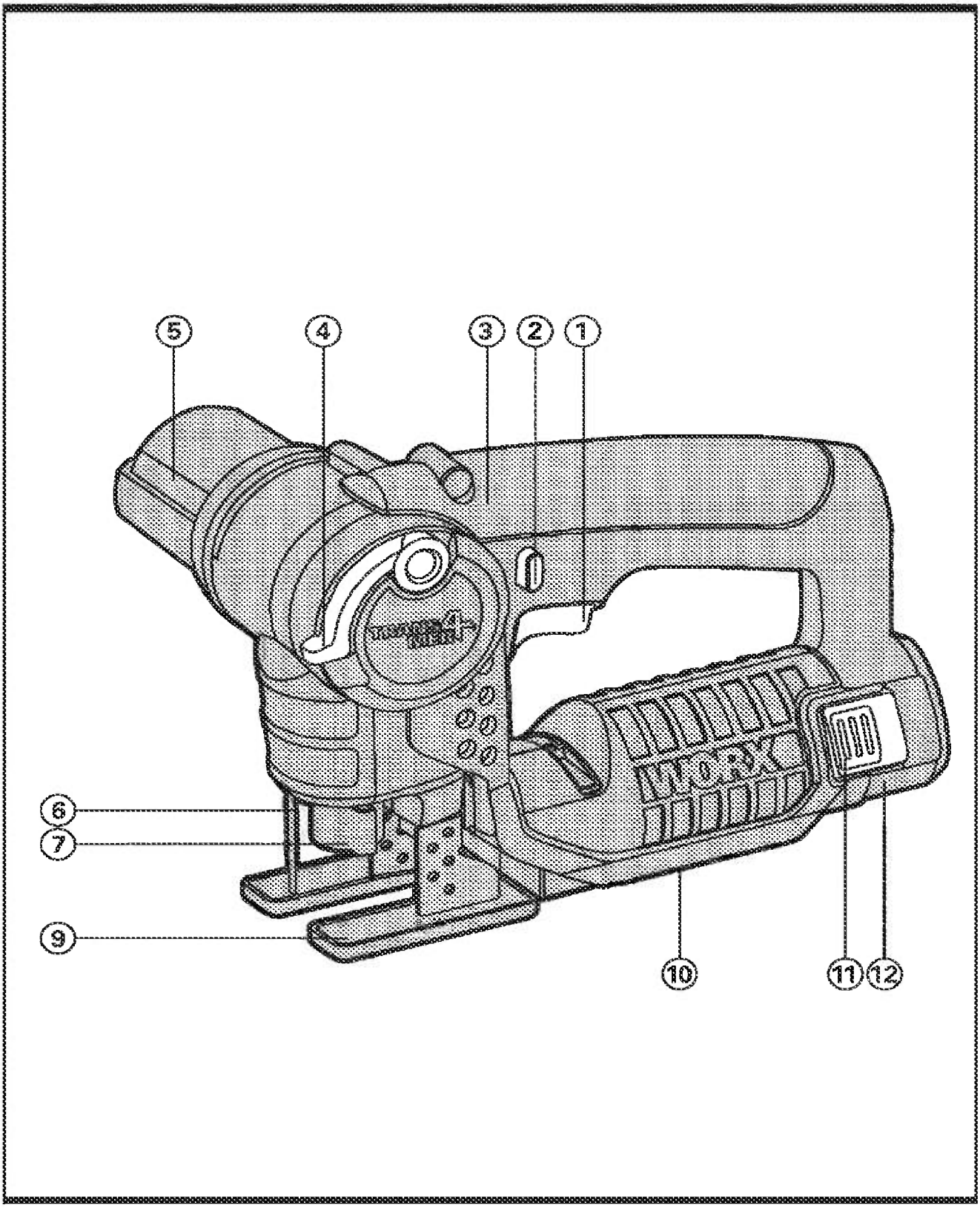
Always charge the battery pack between temperatures 0°C to 30°C



Do not burn



Waste electrical products should not be disposed of with household waste. Please recycle where facilities exist. Check with your Local Authority or retailer for recycling advice


5
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12

1. ON/OFF SWITCH
2. LOCK-OFF BUTTON
3. HAND GRIP AREAS
4. PIVOT RELEASE LEVE
5. MOTOR COVER
6. PROTECTION FINGER
7. BLADE HOLDER
8. LED WORK LIGHT (See Fig. G1)
9. FOOT PLATE
10. BASE PLATE
11. BATTERY RELEASE BUTTON
12. BATTERY PACK
13. CHARGER (See Fig. A)
14. CHARGED INDICATOR LIGHT (See Fig. A)
15. BLADE (See Fig. F)

Not all the accessories illustrated or described are included in standard delivery.

TECHNICAL DATA

Type **WX540 WX540.3 WX540.9 (5-designation of machinery, representative of saw)**

Rated voltage	12V⎓
No load speed	2200/min
Stroke length	16mm
Cutting capacity	
Wood	50mm
PVC pipe	45mm
Steel	4mm
Machine weight	1.2kg

NOISE AND VIBRATION DATA

A weighted sound pressure	L_{pA}: 72dB(A)
K_{pA}	3dB(A)
A weighted sound power	L_{WA}: 83dB(A)
K_{WA}	3dB(A)
Wear ear protection when sound pressure is over	80dB(A)

VIBRATION INFORMATION

Vibration total values (triax vector sum) determined according to EN 60745:	
Cutting sheet metal	Vibration emission value a_{hM} = 7.89m/s²
	Uncertainty K = 1.5m/s²
Cutting board	Vibration emission value a_{hB} = 9.67m/s²
	Uncertainty K = 1.5m/s²
Cutting wooden beam	Vibration emission value a_{hwB} =10.34m/s²
	Uncertainty K = 1.5m/s²

WARNING: The vibration emission value during actual use of the power tool can differ from the declared value depending on the ways in which the tool is used dependant on the following examples and other variations on how the tool is used:

How the tool is used and the materials being cut.
The tool being in good condition and well maintained.
The use the correct accessory for the tool and ensuring it is sharp and in good condition.
The tightness of the grip on the handles and if any anti vibration accessories are used.

And the tool is being used as intended by its design and these instructions.

This tool may cause hand-arm vibration syndrome if its use is not adequately managed.

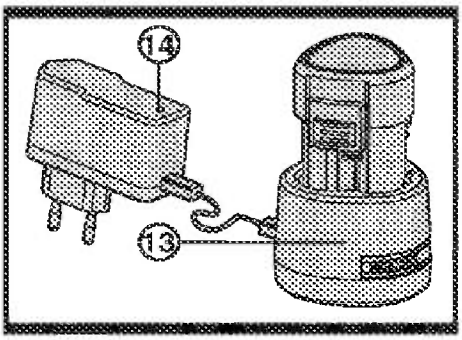
WARNING: To be accurate, an estimation of exposure level in the actual conditions of use should also take account of all parts of the operating cycle such as the times when the tool is switched off and when it is running idle but not actually doing the job. This may significantly reduce the exposure level over the total working period.

Helping to minimise your vibration exposure risk.
ALWAYS use sharp chisels.
Maintain this tool in accordance with these instructions and keep well lubricated (where appropriate).
If the tool is to be used regularly then invest in anti vibration accessories.
Avoid using tools in temperatures of 10°C or less.
Plan your work schedule to spread any high vibration tool use across a number of days.

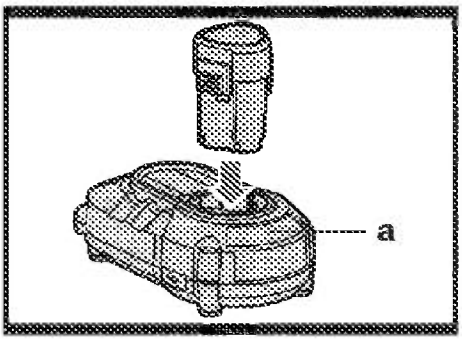
ACCESSORIES

	WX540	WX540.3	WX540.9
Charger	3-5h	30min	/
1.3Ah Li-Ion battery pack	1	1	/
Metal cutting blade	1	1	1
Wood cutting blade	1	1	1
Aluminum cutting blade	1	1	1

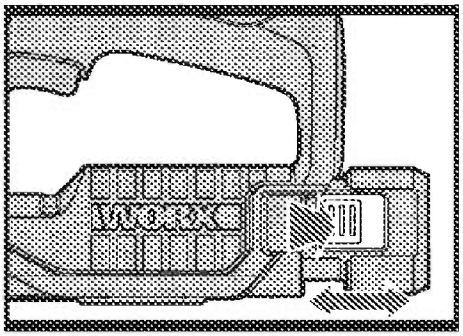
You can only use the blade type shown in Fig. F. Don't use other blade types.
We recommend that you purchase your accessories from the same store that sold you the tool. Use good quality accessories marked with a well-known brand name. Choose the type according to the work you intend to undertake. Refer to the accessory packaging for further details. Store personnel can assist you and offer advice.



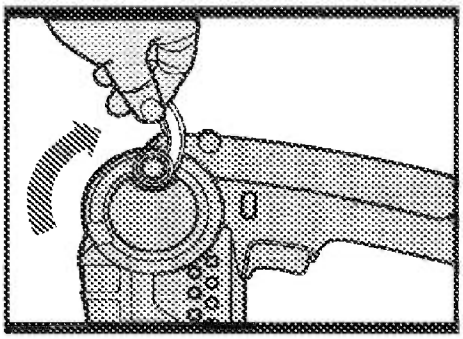
A1



A2



B



C

OPERATING INSTRUCTIONS

NOTE: Before using the tool, read the instruction book carefully.

INTENDED USE

The machine is 2 saws in 1 tool with rep saw and jig saw function, intended for sawing wood, plastic, metal and building materials while resting firmly on the workpiece. It is suitable for straight and curved cuts.

CHARGING PROCEDURE

1. CHARGING YOUR BATTERY PACK

WARNING!

The charger and battery pack are specifically designed to work together so do not attempt to use any other devices. Never insert or allow metallic objects into your charger or battery pack connections because an electrical failure and hazard will occur.

2. BEFORE USING YOUR CORDLESS TOOL.

Your battery pack is UNCHARGED and you must charge once before use. When you charge the new battery or one which has not been used for long periods of time, it may not reach full charge until after you have discharged it fully in use and recharged it several times.

3.1 HOW TO CHARGE YOUR BATTERY PACK (WX540 WX540.9) (See Fig. A1)

Connect the battery charger (13) to the power supply and the green light (14) will illuminate.
Slide the battery pack (12) into the charger base to make the connections. And the red light (14) will illuminate to show charging has started.
After charging approx 3-5hours, the red light will switch to green, which means the battery is full, and charging is completed.

3.2 CHARGING PROCEDURE (WX540.3) (See Fig. A2)

1) Plug the charger into an appropriate outlet. The light (WORX LOGO)(a) will be green.
2) Insert the battery pack into the charger, the WORX logo will be red to indicate the charging process has started.
3) On completion of charge, the logo will turn to be green. The pack is now fully charged, unplug the charger and remove the battery pack.

4. TO REMOVE OR INSTALL BATTERY PACK (See Fig. B)

Locate the battery release buttons (11) on side of battery pack and depress both sides to release the battery pack from your tool. Remove the battery pack from your tool. After it has recharged insert the battery pack into the battery port. A simple push and slight pressure will be sufficient.

ADJUSTMENT

Function of this tool is the combination of a jigsaw and a reciprocating saw, which is realized by operating the pivot release lever (4).

Lift up the pivot release lever to full until it cannot be lifted. (See Fig. C)

Rotate the front portion of the tool into any of the SIX positions (0, 18, 36, 54, 72 and 90deg) (See Fig. D).

Restore the pivot release lever.

In Position I, this tool can be worked as a jigsaw.

In Position VI, this tool can be worked as a reciprocating saw.

WARNING!

When adjusting the tool, you can only hold the foot plate (9) as shown in Fig.E1. Never hold the pivot head as shown in Fig. E2, E3.

WARNING!

- To avoid being pinched, keep hands away from the hinge when changing positions.
- To avoid tool being turned on accidentally, make sure keep your hands away from the lock-off button.

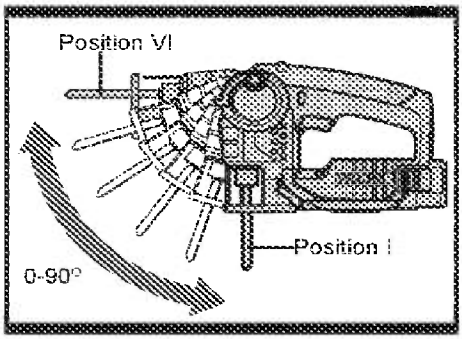
REPLACING/INSERTING THE SAW BLADE

Before any work on the machine itself, remove the battery.

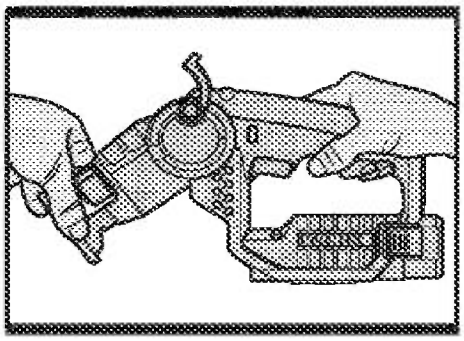
The blade (15) should extend past the foot plate and the thickness of the workpiece during the cut. Select the blade best suitable for the material to be cut and use the shortest blade suited for the thickness of the material.

WARNING! Cut hazard. Blade breakage may occur if the blade does not extend past the foot plate and the workpiece during the cut. Increased risk of personal injury, as well as damage to the foot plate and workpiece may result.

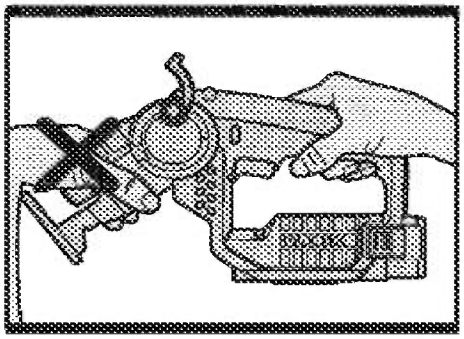
CAUTION: Keep your hands away from the lock-off button to prevent switch actuation before making any adjustments or removing or installing attachments or accessories.



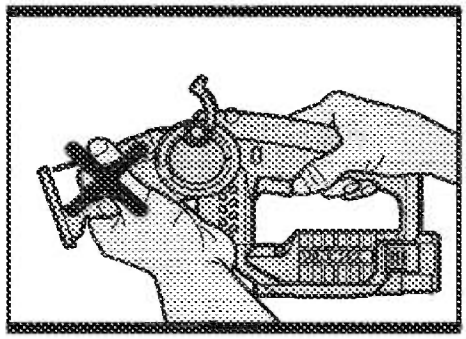
D



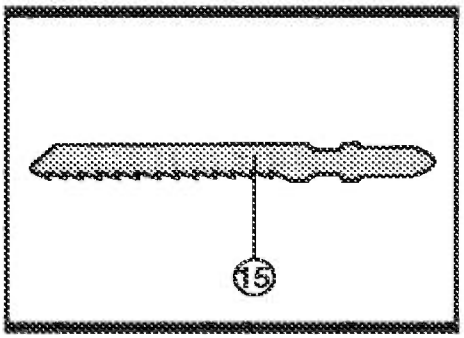
E1



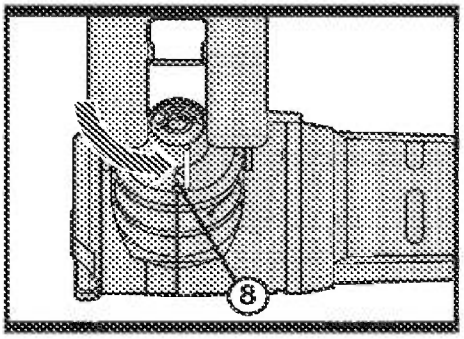
E2



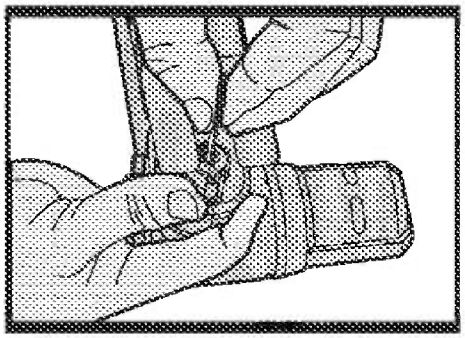
E3



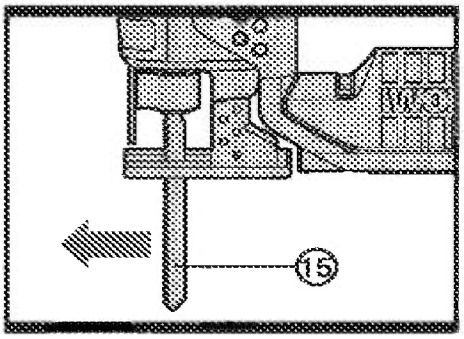
F



G1



G2



H

INSERTING THE SAW BLADE (See Fig. F-H)
Wear protective gloves when assembling the saw blade. Contact with the saw blade can lead to injuries. **You can only use the blade type shown in Fig. F.**
The machine is equipped with a tool-free blade holder (7). This makes possible easy and quick changing of the saw blade without any additional tools.
Rotate the ring counterclockwise and hold in position. Fully insert the blade into the blade holder slot with blade teeth facing forward then release the ring, which will self-rotate and clamp over the top of the blade. (See Fig. G1&G2)

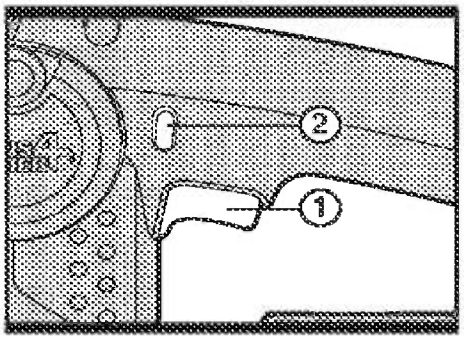
REMOVING THE SAW BLADE
To remove a blade, hold the blade and rotate the blade holder ring counterclockwise to release the blade.
WARNING: The blade may be spring ejected so protect your eyes.
NOTE: When using JIGSAW MODE (90 deg), the blade teeth face forward as shown in Fig. H.

OPERATION

WARNING: Always wear eye protection while operating this or any other power tool.

WARNING: Burn hazard. Do not touch the blade immediately after use. Contact with the blade may result in personal injury.

Before you begin work, ensure the material to be cut is rigid. Small workpieces should be securely clamped to a work table.



I

1. SWITCHING ON AND OFF (See Fig. I)

For starting operation of the machine, press the lock-off button (2) first, then press and hold the On/Off switch (1) afterwards. To switch off the machine, release the On/Off switch (1).

For safety reasons the On/Off switch of the machine cannot be locked; it must remain pressed during the entire operation.

2. HAND GRIP AREAS

Always ensure you maintain a firm grip while operating your jigsaw.

3. PROTECTION FINGER

The finger is located in front of the blade holder. While working, it will help prevent accidental contact with the moving blade.

4. LED WORK LIGHT

A light (8) is built-in near the end of the protection finger. The light will automatically come on each time the on/off switch is depressed.

5. CUTTING

WARNING: Always wear eye protection while operating this power tool.

WARNING:

- Never hold the pivot head when operating the tool.
- Never hold the motor cover when operating the tool. Before cutting any type of material, be sure it is firmly anchored or clamped to prevent slipping. Holding the work by hand or against your body leaves it unstable and may lead to loss of control.
- Place blade lightly against work to be cut, depress the trigger switch and allow it to obtain maximum speed before applying pressure.
- Whenever possible, the saw foot plate must be held firmly against the material being cut. This will prevent the saw from jumping or vibrating and

minimize blade breakage.

- Any cut which puts pressure on the blade, such as angle or scroll cuts, increases potential for vibration, kickback and blade breakage.

WARNING: Shock hazard. Use extra caution when cutting overhead and pay particular attention to overhead wires which may be hidden from view.

WARNING: Use extra caution when cutting overhead and anticipate the path of falling branches and debris ahead of time.

WARNING: Inspect work site for hidden gas pipes, water pipes, or electrical wires before making blind or plunge cuts. Failure to do so may result in explosion, property damage, electric shock, and/or serious personal injury.

WORKING HINTS FOR YOUR MULTI-PURPOSED SAW

If your power tool becomes too hot, run no-load for 2-3 minutes to cool the motor.
Avoid prolonged usage at very low speeds.

GENERAL
Always use a blade suited to the material and material thickness to be cut.
Always ensure the work-piece is firmly held or clamped to prevent movement.
Any movement of the material may affect the quality of the cut. The blade cuts on the upward stroke and may chip the uppermost surface.
Ensure your uppermost surface is a non-visible surface when your work is finished.

MAINTENANCE

Your power tool requires no additional lubrication or maintenance.
There are no user serviceable parts in your power tool. Never use water or chemical cleaners to clean your power tool. Wipe clean with a dry cloth. Always store your power tool in a dry place. Keep the motor ventilation slots clean. Keep all working controls free of dust. Occasionally you may see sparks through the ventilation slots. This is normal and will not damage your power tool.

ENVIRONMENTAL PROTECTION

Waste electrical products should not be disposed of with household waste. Please recycle where facilities exist. Check with your Local Authority or retailer for recycling advice.

TROUBLESHOOTING

Symptom	Possible causes	Possible solution
The tool suddenly stops during operation.	Over load Battery temperature too high Low battery capacity	Relieve the load on the machine immediately and allow cooling for approx. 30 seconds by running the machine on no-load. Charge the battery pack.

PLUG REPLACEMENT (UK & IRELAND ONLY)

If you need to replace the fitted plug then follow the instructions below.

IMPORTANT

The wires in the mains lead are colored in accordance with the following code:

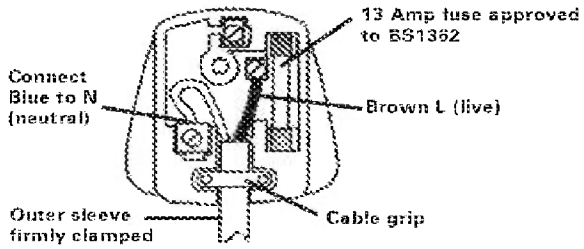
BLUE=NEUTRAL

BROWN=LIVE

As the colors of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows. The wire which is coloured blue must be connected to the terminal which is marked with N. The wire which is coloured brown must be connected to the terminal which is marked with L.

WARNING! Never connect live or neutral wires to the earth terminal of the plug. Only fit an approved 13A BS1363/A plug and the correct rated fuse.

NOTE: If a moulded plug is fitted and has to be removed take great care in disposing of the plug and severed cable, it must be destroyed to prevent engaging into a socket.



DECLARATION OF CONFORMITY

We,
Positec Power Tools (Europe) Ltd, PO Box 152, Leeds, LS10 9DS, UK

Declare that the product,
Description
WORX 12V Li-Ion Multi-purposed saw
Type **WX540 WX540.3 WX540.9**
(S-designation of machinery representative of Saw)
Function **Sawing various materials**

Complies with the following Directives,
Machinery Directive **2006/42/EC**
Electromagnetic Compatibility Directive **2004/108/EC**
RoHS Directive **2011/65/EU**

Standards conform to:
EN55014-1
EN55014-2
EN61000-3-2
EN61000-3-3
EN60745-1
EN60745-2-11

The person authorized to compile the technical file,
Name: Russell Nicholson
Address: Positec Power Tools (Europe) Ltd, PO Box 152, Leeds, LS10 9DS, UK

Leo.Yue

CE

2013/01/16
Leo Yue
POSITEC Quality Manager



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JP,3077837,U

Detail Image
CLAIMS DETAILED DESCRIPTION
DESCRIPTION OF DRAWINGS DRAWINGS

*** NOTICES ***

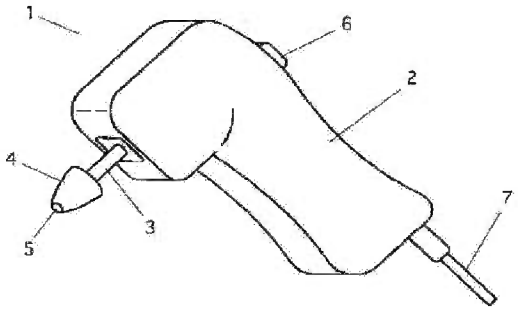
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2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claims]
[Claim 1]An electromotive **** therapy machine connecting a pressing piece at a tip of an axis projected from a case at fixing or a reciprocating-movement output means which is provided freely attachable/detachable and arranged in the case as for the aforementioned axis, and being constituted by axial center direction so that a forward and backward movement is possible [Claim 2]An electromotive **** therapy machine which uses a body apparatus style portion of an electromotive jigsaw tool for a body apparatus style portion of the **** therapy machine according to claim 1, replaces with an established serrated knife at a tip of an output shaft of the electromotive jigsaw tool, and is characterized for a pressing piece by fixing or providing freely attachable/detachable

CLOSE



Representative drawing

Representative drawing | 1 | 2 | 3 | 4 | 5

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Previous Document 1/1 Next Document

To return to the top of this page

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3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed explanation of the device]
[0001]
[Industrial Application]
Especially this design relates to the **** therapy machine for a press therapy treated by pressing the pressure point and the affected part of the body about an electromotive **** therapy machine.
[0002]
[A prior art and a problem]
Conventionally, shiatsu therapy was generally known and many people are undergoing the therapy. Also in that shiatsu therapy, it is observed noting that the method according to a **** therapy has an effect in a chronic disease, and those who desire this therapy are increasing in number with the year.
a **** therapy is free medical treatment about a patient's disease part, a pressure point, and its peripheral part -- when a teacher presses and rubs with skill or a finger, it is the method of giving and treating a stimulus.
That is, the practical use stimulus of the five major **** (the rubor, generation of heat, enlargement, a pain, and recovery) of inflammation can be carried out for the reflective spot of a hand-and-foot part (palm - sole) to a sequela and chronic disease at the illness of a skeleton organ, an injury, and the Lord, and various diseases can be improved.
[0003]
since this **** therapy is the method of treating by stimulus, in order for the strength degree of suppress strength or frictional force to have to put considerable power into skill or a finger importantly therefore -- free medical treatment -- an effective stimulus cannot be given if it is not a teacher.
however, free medical treatment since the patient number is increasing every year -- those who stop a therapy before a complete recovery by self diagnosis also need [in / the physical burdens concerning a teacher just increase, and / the patient itself] the therapy waiting time at the time of going to hospital regularly for inside from a long time.
the free medical treatment from this -- a teacher -- free medical treatment of a patient to a main shock intermediary therapy effective in this chronic disease -- anxious for improvement in efficiency.
[0004]
[Objects of the Invention]
this design is what was made in view of the problem mentioned above -- free medical treatment -- the patient itself aims at providing the electromotive **** therapy machine which can give an operational and effective stimulus easily with a teacher.
[0005]
[Means for Solving the Problem]
A place made into a summary of this design is an electromotive **** therapy machine connecting a pressing piece at a tip of an axis projected from a case at fixing or a reciprocating-movement output means by which provides freely attachable/detachable and the aforementioned axis is arranged in the case, and being constituted by axial center direction so that a forward and backward movement is possible.
[0006]
If a **** therapy machine of this design is described in more detail, a case is formed from resin or metal, appropriately provides a handle, a start switch, etc. for stocks to a predetermined part of the case, and should just constitute them to it. The handle and start switch may be made to install nearby.
In particular structure and a method of a reciprocating-movement output means that are arranged to a case interior are not limited, either, and an axis connected to the reciprocating-movement output means just carries out reciprocating movement, i.e., a forward and backward movement. Although the attitude stroke in particular is not limited, either, a stroke of 10 mm - about 30 mm is good.
[0007]
A power supply for a drive in particular of a main shock intermediary therapy machine may not be limited, either, and AC100V for home use may be used.
As a battery of a square-shaped battery, a common dry cell and also a nickel-cadmium battery of voltage, etc. which can be charged is appropriately built in as a power supply for a drive of a main shock intermediary therapy machine and a **** therapy machine can be carried, it may enable it to use it freely at the portability place.
And the internal organs of the battery charger of the aforementioned battery which can be charged may be carried out to a main shock intermediary therapy machine, or it may be provided by a separate body.
[0008]
As a specific structure of the aforementioned reciprocating-movement output means, Using a motor, a crankshaft, etc., rotational movement is converted to reciprocating movement, and it

may be made to be centered on a forward and backward movement, and may be made to carry out a forward and backward movement for an axis by what is called a linear drive that reverses magnetism with a predetermined cycle and makes reciprocating movement directly. It may be made to change speed of the forward and backward movement.
An axis connected to the reciprocating-movement output means is projected from a case, and a pressing piece for a press therapy is provided at the tip. Attachment in particular to an axis of the pressing piece may not be limited, either, and it may provide fixed or freely attachable/detachable.
[0009]
Also in a pressing piece, it may form for suitable materials, such as resin, wood and metal, and may form further, appropriately combining those materials. And what may provide a metaled spherule at a tip of a pressing piece currently formed from resin or wood, and is magnetized by the spherule may be used. Of course, a magnet piece may be provided.
In particular form, a dimension, etc. of a pressing piece may not be limited, and it may be made a therapy with suitable form and a dimension. As specific form, a thing of form to which the points, such as an abbreviated hemisphere, a triangular pyramid, a pyramid, and a cone, become thin is good.
[0010]
using a body apparatus style portion of an electromotive jigsaw tool for a body apparatus style portion of a **** therapy machine mentioned above, and replacing with an established serrated knife at a tip of an output shaft of the electromotive jigsaw tool -- it is fixing about a pressing piece -- or it may provide freely attachable/detachable.
A fixing member for fixing a serrated knife has projected this electromotive jigsaw tool from a predetermined part of a case, and it is used for that fixing member for a desired serrated knife by it, fixing to it.
Although the form is also somewhat different by each maker, same form is carried out fundamentally, grip handles are provided as integrally as a case by the case upper part, and a start switch is provided by the grip handles. Ahead of a lower case, a fixing member of a serrated knife projects from a case, it provides, and a pressing piece for therapy is attached to this fixing member about this design.
[0011]
[Function]
Since the electromotive **** therapy machine of this design is constituted as mentioned above, the start switch which it has in a case is turned ON, and a **** therapy machine is started. The pressing piece which a reciprocating-movement output means is started with this starting, and the axis connected to this begins a forward and backward movement, and is provided at the tip of that axis also begins a forward and backward movement.
By making the pressure point in which it corresponds to the affected part of the body abut the pressing piece which started this forward and backward movement at direct or its peripheral part, that pressure point follows the lapse of rubor -> exothermic -> enlargement -> pain -> recovery, and results in a complete recovery. That is, a stimulus of the pressing piece which carries out a forward and backward movement stimulates a self-treatment working effect of the body.
[0012]
Also in the **** therapy machine which uses the body apparatus style portion of an electromotive jigsaw tool for the body apparatus style portion of this **** therapy machine, and is providing the pressing piece at the tip of the output shaft of that electromotive jigsaw tool, By turning on the start switch which it has in a case, by making the pressure point in which it corresponds to the affected part of the body abut the pressing piece which started the forward and backward movement at direct or its peripheral part, the pressure point follows the lapse of rubor -> exothermic -> enlargement -> pain -> recovery, and results in a complete recovery. That is, a stimulus of the pressing piece which carries out a forward and backward movement stimulates a self-treatment working effect of the body.
[0013]
[Working example]
When an electromotive **** therapy machine of this design is described according to Drawings below, Fig.1 is a perspective view showing an example of an electromotive **** therapy machine concerning this design.
1 is a **** therapy machine, 2 is a case of the **** therapy machine 1, 3 is the axis projected from the case 2, and 4 is a pressing piece for therapy for pressing the affected parts, such as a pressure point.
The magnet 5 is provided in order to also acquire the magnetic therapy effect to this pressing piece 4.
6 is an electric power switch for starting of the **** therapy machine 1, and 7 is a power cord connected to a home electric socket. And the reciprocating-movement output means (not shown) arranged in the case 2 starts by ON of this electric power switch 6.
[0014]
Fig.2 is an enlarged drawing of an axial projection part periphery of a case.
The pressing piece 4 is attached to the axis 3 projected from the case 2, by turning on the electric power switch 6, a reciprocating-movement output means arranged in the case 2 starts, and a forward and backward movement is started for the pressing piece 4 by axial center direction of the axis 3 with the axis 3.

[0015]
Fig.3 is a perspective view showing an example of a portable **** therapy machine which mounted a battery.
The battery 8 is mounted on a rear part of the case 2 of 1 of a **** therapy machine, and it enables it to carry freely anywhere.

[0016]
Fig.4 is a perspective view showing a **** therapy machine which used an electromotive jigsaw tool as a body apparatus style portion.
11 is the **** therapy machine constituted using a body apparatus style portion of that electromotive jigsaw tool 9, and it is a serrated knife fitting shaft of the electromotive jigsaw tool 9, and 31 was replaced with a serrated knife, and has attached the pressing piece 4 at a tip of this serrated knife fitting shaft 31.
5 is the magnet provided in order to acquire the magnetic therapy effect. 61 is an electric power switch for starting of the **** therapy machine 11, and 71 is a power cord connected to a home electric socket.
And the **** therapy machine 11 starts by ON of this electric power switch 61, and a forward and backward movement is started for the pressing piece 4 by the axial center direction of the axis 31 with the serrated knife fitting shaft 31.
[0017]
Fig.5 is the figure showing an example of a busy condition.
The start switch 6 which it has in the case 2 is turned ON, the **** therapy machine 1 is started, and a pressure point in which it corresponds to the affected part of the body is made to abut the pressing piece 4 which started a forward and backward movement at direct or its peripheral part.

By making the pressure point of the sole 10 abut by a diagram, and applying continuous pressing stimulation in this way, the pressure point follows the lapse of rubor -> exothermic -> enlargement -> pain -> recovery, and results in a complete recovery. That is, a stimulus of the pressing piece which carries out a forward and backward movement can stimulate and treat a self-treatment working effect of the body.
[0018]
[Effect]
since the electromotive **** therapy machine of this design is constituted as mentioned above -- free medical treatment -- operational [in the patient itself] with a teacher -- free medical treatment -- if a teacher uses it, a stimulus effective for a patient's disease part, a pressure point, and its peripheral part can be given -- and free medical treatment -- since a teacher's physical burdens are also eased -- free medical treatment -- efficiency improves remarkably.
Since this electromotive **** therapy machine can be operated simply and easily, when the patient itself uses it during the therapy waiting time at the time of going to hospital regularly, or medical treatment at a house, it can further pull out the validity of a **** therapy.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
A [FIG. 1] The perspective view showing an example of the electromotive **** therapy machine concerning this design
A [FIG. 2] The enlarged drawing of an axial projection part periphery of a case
A [FIG. 3] The perspective view showing an example of the portable **** therapy machine which mounted the battery
A [FIG. 4] The perspective view showing the **** therapy machine which used the electromotive jigsaw tool as the body apparatus style portion
A [FIG. 5] The figure showing an example of a busy condition
[Explanations of letters or numerals]
1-**** therapy machine, 11-**** therapy machine, 2-case, 3-axis, 31-serrated knife fitting shaft, 4-pressing piece, 5-magnet, 6-electric power switch, 61-electric power switch, 7-power cord, 71-power cord, 8-battery, 9-electromotive jigsaw tool, 10-sole

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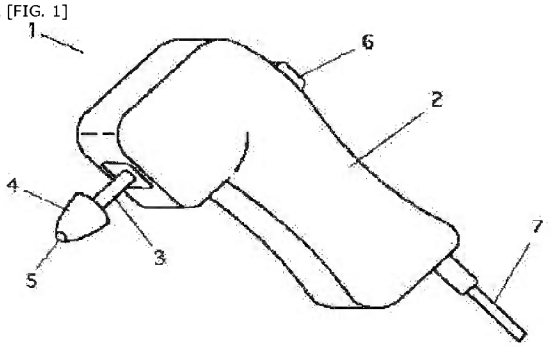
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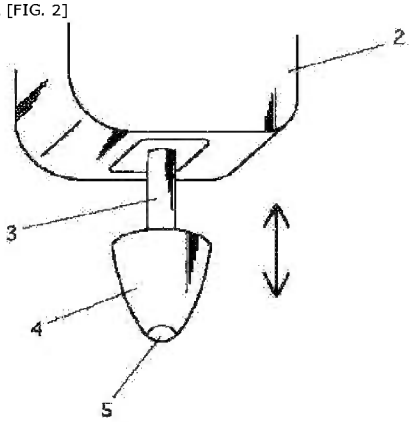
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DRAWINGS

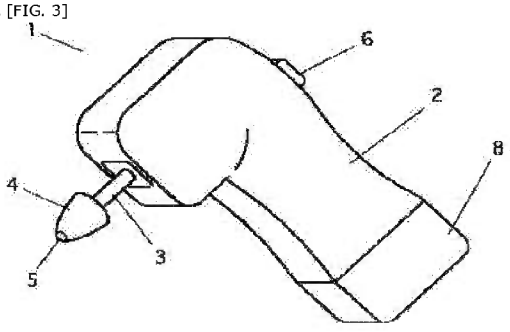
A [FIG. 1]



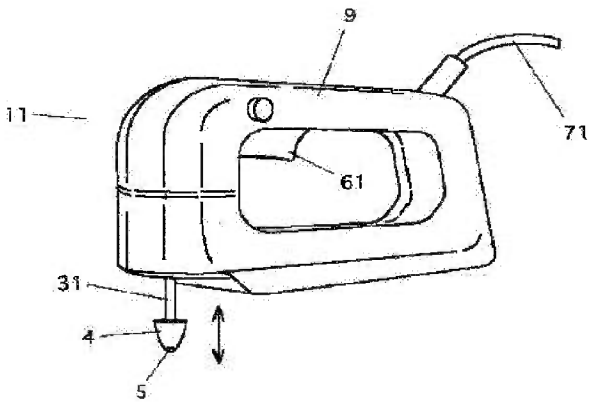
A [FIG. 2]



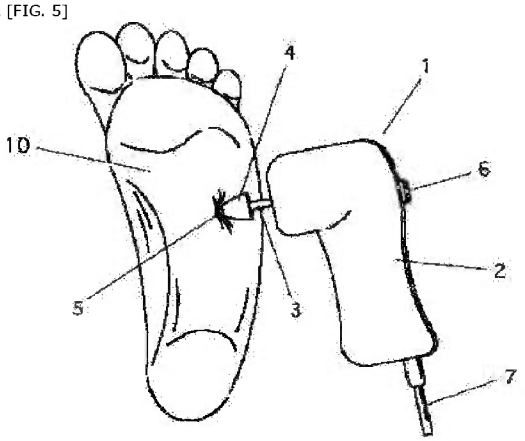
A [FIG. 3]



A [FIG. 4]

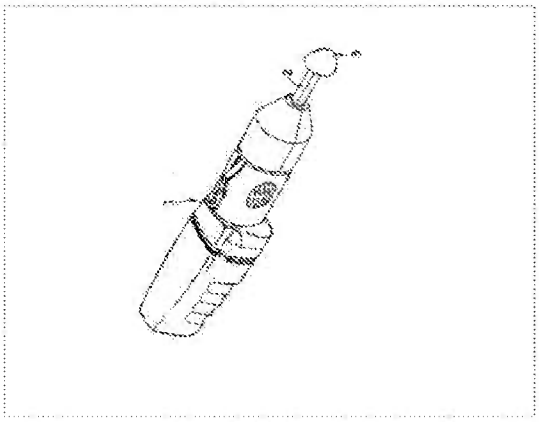


∧ [FIG. 5]



Legal Status

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	A61H 23/02
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(22)Date of filing	06.07.1988
(71)Applicant	SANDEN ENG KK
(72)Inventor	KIKUCHI YASUARI



(54)EFFECTIVE SPOT HITTER

(57)Abstract

PURPOSE: To execute a miniaturization and a light weight by providing an effective spot hitting ball mountably and removably in the head part of a reciprocating shaft to be reciprocated in being electrically driven or vacantly moved.

CONSTITUTION: An effective spot hitter has a main body 1 in a bar shape, and from the main body 1, a reciprocating shaft 2 to be resiprocated in being electrically driven or vacantly moved is projected. In the head part of the reciprocating shaft 2, an effective spot hitting ball 3 is mountably and removably provided. The effective spot hitting ball 3 is in a screwing system or fit-in system, and it is fitted to the reciprocating shaft 2.

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CLAIMS

[Claim(s)]

Pressure point ****** comprising:
A both-way shaft (2) which 1 and a main part (1) are used as a bar type, and moves reciprocately by electric or a lost motion.
A pressure point hit ball (3) made freely attachable/detachable to a point of the aforementioned both-way shaft (2).

Pressure point ****** comprising:
A both-way shaft (2) which 2 and a main part (1) are used as a pistol type, and moves reciprocately by electric or a lost motion.
A pressure point hit ball (3) made freely attachable/detachable to a point of the aforementioned both-way shaft (2).

Pressure point ****** comprising:
A both-way shaft (2) which 3 and a main part (1) are used as a sideways abbreviation T type, and carries out both-way linkage by electric or a lost motion.
A pressure point hit ball (3) made freely attachable/detachable to a point of the aforementioned both-way shaft (2).

Hold a sliding body (7) slidably in 4 and a casing (4), and it inserts some steel balls (12) in a receive hole (11) provided to an inner surface of a sliding body (7), enabling free rotation, Pressure point ****** of a description to one claim of Claim 1 having the reciprocating mechanism (A) which inserted slidably some steel balls (12) inserted in the aforementioned receive hole (11) in a cam groove (16) of the shape of a sine curve provided on the surface of a rotating body (10) to Claim 3.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[Industrial Application]
Invention of this application is struck and struck and relates to pressure point ****** of a formula.
[Description of the Prior Art]
Conventionally, it struck and struck and what carried out the hammer die existed in pressure point ****** of the formula.
The reciprocating mechanism of pressure point ****** which carried out this hammer die, By attaching one pivot of bevel gear to the eccentric position of bevel gear, for example, and rotating another pivot of bevel gear, in order to change the rotational force of a motor into the power of reciprocative direction, Eccentric rotation of the aforementioned pivot attached to the eccentric position was carried out, this eccentric rotation power was converted to the power of reciprocative direction, and this reciprocating mechanism was included in the head section of the hammer.
[Problem(s) to be Solved by the Invention]
However, in pressure point ****** which carried out the above-mentioned conventional hammer die, Since it becomes a form which has the lower part of a hand part in a hand when it has a hand part of a hammer in a hand and presses a pressure point hit ball against the affected part, The reciprocating mechanism used for pressure point ****** which the problem that it is hard to press against the position of the affected part aiming at a pressure point hit ball occurs, and carried out the conventional hammer die, The mechanism itself became a high thing of bulk and pressure point ****** which carried out the hammer die incorporating this mechanism had the problem that a miniaturization and a weight saving were not made.
Then, pressure point ****** of invention of this application is made in order to solve the problem which pressure point ****** which carried out the above-mentioned conventional hammer die has.
[The means for solving a technical problem]
Therefore, in the invention of this application according to claim 1, a main part (1) is used as a bar type, and it has a both-way shaft (2) which moves reciprocately by a lost motion, and is considering it as electric or the thing which provided the pressure point hit ball (3) made freely attachable/detachable at the point of the aforementioned both-way shaft (2). In the invention of this application according to claim 2, a main part (1) is used as a pistol type, and it has a both-way shaft (2) which moves reciprocately by a lost motion, and is considering it as electric or the thing which provided the pressure point hit ball (3) made freely attachable/detachable at the point of the aforementioned both-way shaft (2). In the invention of this application according to claim 3, a main part (1) is used as a sideways abbreviation T type, and it has a both-way shaft (2) which moves reciprocately by a lost motion, and is considering it as electric or the thing which provided the pressure point hit ball (3) made freely attachable/detachable at the point of the aforementioned both-way shaft (2). In the invention of this application according to claim 4, In invention of the description to one claim of Claim 3, a sliding body (7) is slidably held in a casing (4) from Claim 1, Some steel balls (12) are inserted in the receive hole (11) provided to the inner surface of the sliding body (7), enabling free rotation, It should have the reciprocating mechanism (A) which inserted slidably some steel balls (12) inserted in the aforementioned receive hole (11) in the cam groove (16) of the shape of a sine curve provided on the surface of the rotating body (10).
[Function]
As a result of giving the above-mentioned means, pressure point ****** of invention of this application in the invention according to claim 1, Shall be very easy to have the main part (1) used as the bar type, and in the invention according to claim 2, Can make the handle part of the main part (1) used as the pistol type into the position which is very easy to have, and in the invention according to claim 3, From a vertical direction or a transverse direction, can have a handle part of the main part (1) used as the sideways abbreviation T type, and in the invention according to claim 4, In addition to the working effect of invention of the description to one claim of Claim 3, the rotating body (10) should be inserted for the reciprocating mechanism (A) into the sliding body (7) from aforementioned Claim 1, and a sliding body (7) and rotating bodies (10) shall have been arranged to straight line shape.
[Example]
Hereinafter, the constituent of the invention of this application is described based on the Drawings shown as an Example.
Fig. 1 is a perspective view showing an Example of the invention according to claim 1.
A main part (1) is used as a bar type, and it has a both-way shaft (2) which moves reciprocately by a lost motion, and is considering it as electric or a thing which provided a pressure point hit ball (3) made freely attachable/detachable at a point of this both-way shaft (2).
In order to provide to the point of a both-way shaft (2), using the aforementioned pressure point hit ball (3) as freely attachable/detachable, For example, as shown in Fig. 2, it can be

made the thing of the system which thrusts a pressure point hit ball (3) into the screw groove (2a) provided to the point of the both-way shaft (2), or can carry out as proper composition, such as a thing of a system which inserts a pressure point hit ball (3) in the point of a both-way shaft (2) besides this Example. Proper things, such as a tree, a synthetic resin, rubber, and metal, can be used for the material of the aforementioned pressure point hit ball (3), and them the form, It can be considered as [as shown in (c) from (a of everything but a ball and a hemisphere, for example, Fig. 3) / spherical surface body form or what is proper in addition to this], and although it is preferable that a diameter also sets the size to about 5 mm - 30 mm further, it may enlarge rather than this if needed, or may make it small. As shown in (b) of aforementioned Fig. 3, and (c), in what was made small, it becomes easy to press a pressing part for the form of the aforementioned pressure point hit ball (3) by the position of the affected part aiming at a pressure point hit ball (3), and the pressure point **** effect can be heightened.
Fig. 4 is a perspective view showing an Example of the invention according to claim 2.
A main part (1) is used as a pistol type, and it has a both-way shaft (2) which moves reciprocately by a lost motion, and is considering it as electric or a thing which provided a pressure point hit ball (3) made freely attachable/detachable at a point of this both-way shaft (2).
In order to provide to the point of a both-way shaft (2), using the aforementioned pressure point hit ball (3) as freely attachable/detachable, it can carry out in the same manner as said invention according to claim 1, and can carry out also about the material of a pressure point hit ball (3), form, and a size in the same manner as said invention according to claim 1.
Fig. 5 is a perspective view showing an Example of the invention according to claim 3.
A main part (1) is used as a sideways abbreviation T type, and it has a both-way shaft (2) which moves reciprocately by a lost motion, and is considering it as electric or a thing which provided a pressure point hit ball (3) made freely attachable/detachable at a point of this both-way shaft (2).
In order to provide to the point of a both-way shaft (2), using the aforementioned pressure point hit ball (3) as freely attachable/detachable, it can carry out in the same manner as said invention according to claim 1, and can carry out also about the material of a pressure point hit ball (3), form, and a size in the same manner as said invention according to claim 1.
It is a perspective view which Fig. 6 and Fig. 7 show an Example of the invention according to claim 4, and Fig. 6 carries out the essential part cross sectional view, and Fig. 7 carries out the half section of the reciprocating mechanism (A), and is shown.
A metal receptacle (8) which a bearing (5) is attached, and an angle hole (6) is provided by the other end of a casing (4), and holds a sliding body (7) slidably to an inner surface of a casing (1) further is provided by one end of a casing (4).

The aforementioned sliding body (7) is providing a square-shaped both-way shaft (2) at the end.
This both-way shaft (2) is inserted in an angle hole (6) of the aforementioned casing (4) via a metal receptacle (9).
A sliding body (7) is carrying out the opening of the other end.
A rotating body (10) is slidably inserted from this opening.
The receive hole (11) is provided by the inner surface of the sliding body (7) at one place or two places. And the Johan part of the steel ball (12) is inserted in this receive hole (11), enabling free rotation. It is performed by proper means -- it is because the bolt (13) which provided the bolthole to the sliding body (7) and provided the receive hole (11) to the lower end of the screw part at this bolthole is thrust -- in order to provide the aforementioned receive hole (11) to the inner surface of a sliding body (7).
The aforementioned rotating body (10) is providing the rotating shaft (15) via the bearing receiving part (14) at the end. The sine curve-like cam groove (16) is provided in the surface of this rotating body (10). And the lower half part of the steel ball (12) inserted in the aforementioned receive hole (11) is slidably inserted in this cam groove (16). The bearing receiving part (14) of the aforementioned rotating body (10) is held at the bearing (5) of a casing (4), and is attached firmly by the washer (17).
(B) is a power mechanism, in this Example, what was made into the electromotive type is shown and the zipper (20) is provided by the point of the motor case (19) having a motor with an output shaft (18). And the rotating shaft (15) of the rotating body (10) of the aforementioned reciprocating mechanism (A) is connected with the output shaft (18) of the aforementioned motor by this zipper (20).
It is the pressure point hit ball (3) provided as (3) being freely attachable/detachable to the point of the both-way shaft (2) of the aforementioned sliding body (7), In order to provide to the point of a both-way shaft (2), using this pressure point hit ball (3) as freely attachable/detachable, it can carry out in the same manner as said invention according to claim 1, and can carry out also about the material of a pressure point hit ball (3), form, and a size in the same manner as said invention according to claim 1.
[Effect of the Invention]
Pressure point ****** of invention of this application is constituted as stated above, and in the invention according to claim 1, Shall be very easy to have the main part (1) used as the bar type, and in the invention according to claim 2, Can make the handle part of the main part (1) used as the pistol type into the position which is very easy to have, and in the invention according to claim 3, From a vertical direction or a transverse direction, can have a handle part of the main part (1) used as the sideways abbreviation T type, and in the invention according to claim 4, In addition to a working effect of invention of the description to one claim of Claim 3, a rotating body (10) is inserted for a reciprocating mechanism (A) into a sliding body (7) from aforementioned Claim 1, Since a sliding body (7) and rotating bodies (10) shall have been arranged to straight line shape, when the invention according to claim 4 presses the pressure

point hit ball of pressure point ****** against the affected part from Claim 1, It becomes easy to press against the position of the affected part aiming at a pressure point hit ball, and a reciprocating mechanism can be made [of bulk] low in the invention according to claim 4, and pressure point ****** of this invention incorporating this mechanism has the outstanding effect that a miniaturization and a weight saving are made.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

Fig. 1 is a perspective view showing the Example of the invention of this application according to claim 1. Fig. 2 is an explanatory view showing an example of the system which provides a pressure point hit ball as freely attachable/detachable to the point of the both-way shaft of invention of the Claim 1 description. Fig. 3 is a perspective view showing the pressure point hit ball of the various form used for invention of this application. Fig. 4 is a perspective view showing the Example of the invention of this application according to claim 2. Fig. 5 is a perspective view showing the Example of the invention of this application according to claim 3. Fig. 6 is an essential part cross sectional view showing the Example of the invention of this application according to claim 4. Fig. 7 is a perspective view in which carrying out the half section of the reciprocating mechanism of invention of the Claim 4 description, and showing it.

(1) ... Maln part (2) ... Both-way shaft

(3) ... Pressure point hit ball (4) ... Casing

(7) ... Sliding body (10) --- Rotating body

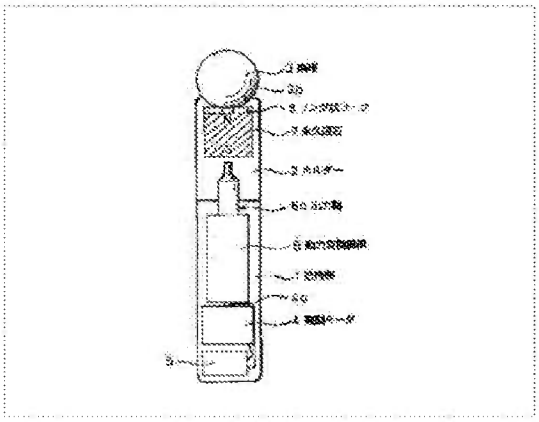
(11) ... Receive hole (12) --- Steel ball

(16) ... Cam groove

(A) ... Reciprocating mechanism

Legal Status

(11)Publication number	07-051393
(43)Date of publication of application	28.02.1995
(51)Int.Cl.	A61N 2/08 A61H 15/00 A61H 23/02 A61H 23/02
(21)Application number	05-220618
(22)Date of filing	12.08.1993
(71)Applicant	HITACHI METALS LTD M K JIKOU:KK
(72)Inventor	MATSUI KAZUMI KANEKO EIJI KOBAYASHI AKIO ODA KOICHI



(54)ELECTRIC MASSAGE MACHINE

(57)Abstract

PURPOSE: To provide an electric massage machine which may be easily applied by hand to the affected part, easy to operate, and guaranteed to give a full effect of magnetic treatment by the use of a vibration device and a permanent magnet.

CONSTITUTION: The electric massage machine comprises a grip part 1, a holder 2, and a steel ball 3. Inside the grip part 1, an electric motor 4 and a power conversion mechanism 6 which converts the rotational power of the motor to a linear alternating motion, or to a rotational alternating motion are installed. The holder 2 connected to the output shaft of the power conversion mechanism 6 is fitted with a permanent magnet 7 at its head and a steel ball 3 which is mounted on the tip of the holder 2 attracted by the magnetic force of the permanent magnet 7.

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CLAIMS

[Claim(s)]
[Claim 1]An electric massager comprising:
A hold part provided with a power converter style which it has an electric motor and converts rotational force of a motor to a straight-line round trip or a rotation round trip.
A holder which was connected with an output shaft of the aforementioned power converter style, and equipped an inside with a permanent magnet, and a steel ball in which magnetism of the aforementioned permanent magnet adsorbs at a tip of a holder.

[Claim 2]A massager of Claim 1 having formed a permanent magnet in axial direction both ends at a cylindrical shape which has a magnetic pole, having interposed a ring shape yoke between a permanent magnet and a steel ball, and making it act in the direction in which a magnetic field goes to the steel ball side from the holder side.
[Claim 3]An electric massager of Claim 1 forming a permanent magnet in axial direction both ends at thick plate ring type which has a magnetic pole, and making it act in the direction in which a magnetic field goes to the steel ball side from the holder side.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application]The present invention relates to the electric massager which has in a hand, hits against the bodily affected part, and could be made to perform an easy and, more effective massage.
[0002]
[Description of the Prior Art]In order to massage a shoulder, an arm, a foot, etc. easily conventionally at any place, various kinds of massagers are proposed. There are some the kind of massagers it was made to repeat frequent appearance of a push member, while going a roller around via various kinds of gears with a drive motor (JP H4 - 297259A). The thing provided with rocking equipment or the thing provided with the magnet is known. A vibration body is attached to the mounting body with which the body can be equipped as a thing provided with rocking equipment, and there are some which provided the affected part contact part from which the form in which two or more places of the outer surface of the vibration body are abutted at the affected part of the body differs (JP H3 - 193055A). And it enables it to massage by attaching a mounting body to an arm etc., applying the affected part contact part of a wish to the affected part, and operating a vibration body, without people having a massager in a hand. As a massager which uses a magnet, make two or more permanent magnets the diaphragm attached to the vibrating member, and polarity is carried out for opposite, respectively, and there are some which were attached so that it might arrange at equal intervals to these every direction (JP H2 - 168970A). And he is trying to produce the magnetic therapy effect by generating a relative displacement positively between two or more permanent magnets on a diaphragm, and the human body affected part.
[0003]
[Problem to be solved by the invention]Although a roller is rotated or some conventional massagers vibrate an affected part contact part, it is difficult to improve a massage effect sufficiently only by those operations. He makes the current carrying part of a human body generate weak electromotive force, and is trying to bring the magnetic therapy effect to it by carrying out reciprocation moving of a plurality of permanent magnets to a diaphragm in the massager furnished with a plurality of permanent magnets. however, in order to bring about the magnetic therapy effect, arrangement of a plurality of permanent magnets is a problem, and ********** is not easy in a predetermined effect. Since further a plurality of permanent magnets were attached to the even diaphragm, it was difficult to apply it to the affected part of a human body, and it also difficult to operate a massager for a therapy. Then, while having a massager in a hand and making it easily hit against the affected part, the present invention makes the operation easy and an object of the present invention is to enable it to exert the magnetic therapy effect sufficiently further using rocking equipment and a permanent magnet.
[0004]
[Means for solving problem]The present invention constituted the electric massager from a hold part, a holder, and a steel ball in order to achieve the above-mentioned object. It had the electric motor and equipped the hold part with the power converter style which converts the rotational force of a motor to a straight-line round trip or a rotation round trip. The holder was connected with the output shaft of the aforementioned power converter style, equipped the tip side with the permanent magnet, and provided the steel ball in which the magnetism of the aforementioned permanent magnet adsorbs at the tip of a holder. The permanent magnet was formed in the cylindrical shape which has a magnetic pole to axial direction both ends, interposed the ring shape yoke between the permanent magnet and the steel ball, and the magnetic field made it act in the direction which goes to the steel ball side from the holder side. Without furthermore using a ring shape yoke, a permanent magnet can be formed in the thick plate ring type which has a magnetic pole to axial direction both ends, and a magnetic field can also make it act in the direction which goes to the steel ball side from the holder side.
[0005]
[Function]The electric massager of the present invention operates similarly the steel ball which can carry out straight-line reciprocation moving and both-way rotation for the output shaft by the operation of the power converter style in a hold part, carries out straight-line reciprocation moving and both-way rotation, and is making the holder adsorb at the tip of a holder with a permanent magnet by that cause. For this reason, oscillation actuation and the magnetic field of a permanent magnet will act on a steel ball. Thus, if the steel ball was operated and the steel ball is applied to the affected part of the human body, since it is a conductor, an oscillating magnetic field will act on a human body, and an eddy current will generate a human body on a human body. By this eddy current, it can improve and have the circulation of the affected part of a human body, and can carry out a more preferable curative effect.
[0006]
[Working example]The 1st Example of the present invention is described by Fig.1. An electric massager comprises the hold part 1 of the cylindrical shape made of resin, the holder 2 made of resin connected at the tip of a hold part, and the steel ball 3 provided at the tip of a holder,

for example, has the hold part 1 in a hand, can apply the steel ball 3 to the affected part of a human body, and can treat it now. Inside the hold part 1, the electric motor 4, the dry cell 5, and the power converter style 6 are provided, and rotation of the electric motor 4 is converted to a linear reciprocating motion or rotation reciprocating movement by the power converter style 6. 50 - 200 c/s is used and the cycle of a round trip of the linear reciprocating motion of the power converter style 6 and rotation reciprocating movement can use a small rechargeable battery instead of the dry cell 5.

[0007]The power converter style 6 can apply the mechanism currently disclosed in the JP S62 - 196463A, for example. Namely, follow and carry out a linear reciprocating motion to the cam for linear reciprocating motions which carries out eccentric rotation in connection with the normal rotation of the output shaft 4a of the electric motor 4, the cam for rotation reciprocating movement which carries out eccentric rotation with the inversion of the output shaft of an electric motor, and the cam for linear reciprocating motions, and. The cam follower which follows for the cam for rotation reciprocating movement, and carries out a rotation round trip is built in and constituted, and the output shaft 6a provided to the cam follower is made to project from the tip of the hold part 1. And the rotational operation of the cam for linear reciprocating motions is carried out, the output shaft 6a carries out a linear reciprocating motion, and, thereby, it makes the holder 2 exercise similarly by rotating the electric motor 4 normally. If the electric motor 4 is reversed, the rotational operation of the cam for rotation reciprocating movement is carried out, and the output shaft 6a will carry out rotation reciprocating movement, and, thereby, will carry out the rotation round trip (rolling operation) of the holder 2.

[0008]The holder 2 is substantially formed in the cylindrical shape of the same outer diameter with the hold part 1, the output shaft 6a projected from the hold part 1 to the engagement hole of the base of a holder is inserted, both are connected, and the aforementioned operation of the output shaft 6a is transmited to the holder 2. The cylindrical permanent magnet 7 is provided in the holder 2 and the direction of a same axis at the tip side in the holder 2, and the permanent magnet 7 has a magnetic pole to axial direction both ends, and is magnetized by the aforementioned vibration direction and right angle direction (direction which faces to a steel ball from the holder side) of the output shaft 6a. The ring shape yoke 8 which is from iron, steel, etc. on the tip side of the permanent magnet 7 is provided, and he is trying for the magnetic field of the permanent magnet 7 to act on the steel ball 3 cylindrically. The tip of the holder 2 is formed in surface-of-a-sphere concave part 2b to which it corresponded to the steel ball 3, it abuts in the surface-of-a-sphere concave part, and the steel ball 3 adsorbs by the magnetism of the permanent magnet 7. It may gold-plate in order to improve a feeling of contact to the affected part or to take out corrosion prevention or a high grade feeling to the surface of the steel ball 3. And if the steel ball 3 is applied to the affected part, operating the output shaft 6a of the power converter style 6 by the drive of the electric motor 4, and carrying out a linear reciprocating motion or rotation reciprocating movement for the holder 2, By the magnetic field to which the permanent magnet 7 in a holder acts on the affected part through the steel ball 3, an eddy current occurs on a human body and it can perform a preferable therapy.

[0009]Next, the 2nd Example of the present invention is described by Fig.2. This Example forms the permanent magnet 7a in the holder 2 in thick plate ring type, and it made it have a magnetic pole to those axial direction both ends. And even if it does not provide a ring shape yoke in the holder 2, a curative effect can be improved, as the magnetic field of the permanent magnet 7a acts on the steel ball 3 cylindrical and an eddy current can be generated near the affected part by vibration and a magnetic field. Other composition working effects are the same as that of the 1st Example.

[0010]

[Effect of the Invention]Since the magnetic field of a permanent magnet is made to act while vibrating the steel ball which hits against the affected part of a human body according to the electric massager of the present invention, a human body can be made to be able to generate an eddy current at the time of the operation, circulation can be improved by that cause, and a curative effect can be improved. Since a ring form yoke is provided to the tip side of a permanent magnet or the permanent magnet is formed in a ring form, a magnetic field can act effective in the affected part via a steel ball, and can improve a curative effect. Furthermore, since a massager has the hold part in a hand and only applies a steel ball to the affected part, it can massage the part of a wish of a human body easily [operation] and easily.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
A [FIG. 1] It is a cross sectional view of the electric massager of the 1st Example of the present invention.
A [FIG. 2] It is a fragmentary sectional view of the electric massager of the 2nd Example of the present invention.
[Explanations of letters or numerals]
1 Hold part
2 Holder
3 Steel ball
4 Electric motor
6 Power converter style
7 Permanent magnet
8 Ring shape yoke

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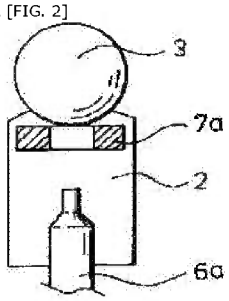
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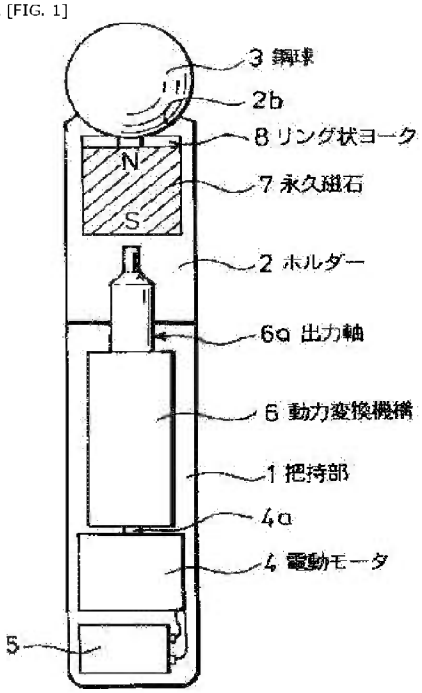
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DRAWINGS

Λ [FIG. 2]

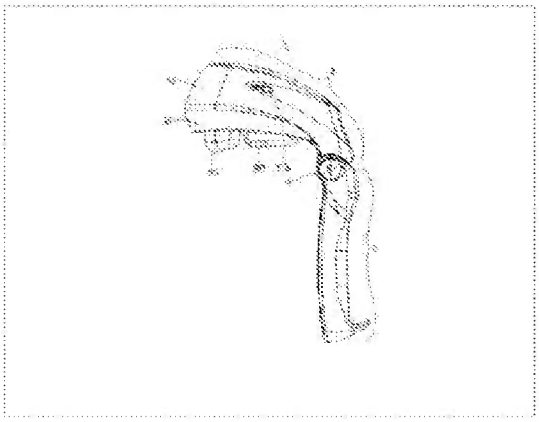


A [FIG. 1]



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(54)MASSAGE DEVICE

(57)Abstract

PROBLEM TO BE SOLVED: To provide a massage device having a constitution of clearly changing a therapy range and a therapy interval in a small and lightweight device suited to a handheld type.

SOLUTION: This massage device 1 comprises a body 2 and a head part 3 connected to the body 2 by a shaft part 4. A main therapeutic element 60 and a sub therapeutic element 80 are aligned in the longitudinal direction of the head part 3 and turnably supported on the interior of the head 3. The sub therapeutic element 80, with the main therapeutic element 60, turns between a lower limit fixed position fixed to the main therapeutic element 60 for contributing to the therapeutic operation and an upper limit fixed position fixed to the head part 3 so that the main therapeutic element 60 alone can contribute to the therapeutic operation. The head part 3 is provided with a button 115 for releasing the lock of the sub therapeutic element 80. The sub therapeutic element 80 reaches the upper limit fixed position, when the button 115 is pushed to push the sub therapeutic element 80 therein, and reaches the lower limit fixed position when the button 115 is pushed with its being in the upper limit fixed position.

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CLAIMS

[Claim(s)]
[Claim 1]
A massager which is provided with the following and characterized by installing said main treatment element and a subtreatment element in a longitudinal direction of the aforementioned head section side by side.
A head section.
The main treatment element and a subtreatment element which were provided so that a projecting amount from the aforementioned head section might be made variable.
it is free medical treatment to said main treatment element -- a driving means to operate.
An engag%ment means which makes the aforementioned subtreatment element removable selectively at said main treatment element.

[Claim 2]
the aforementioned subtreatment element -- free medical treatment of said main treatment element -- a larger movable range than a movable range in operation, [have and] The massager according to claim 1, wherein the one end side from which a projecting amount from the aforementioned head section in the movable range concerned serves as the maximum corresponds to the one end side from which a projecting amount from the aforementioned head section in a movable range of said main treatment element serves as the maximum.
[Claim 3]
The massager according to claim 2, wherein said main treatment element and a subtreatment element are individually supported pivotably by the one end side of the aforementioned head section, respectively, enabling free rotation and the rotational center lies at right angles to a longitudinal direction of the aforementioned head section.
[Claim 4]
a time of having the following and the aforementioned engagement part engaging with an engaged portion on said main treatment element side -- said main treatment element and a subtreatment element -- integrally -- free medical treatment, [operate and] while the aforementioned engagement part is engaging with an engaged portion on the aforementioned head section side, only said main treatment element is free medical treatment -- the operating massager according to claim 3.
An engagement part by which the aforementioned engagement means was provided by the aforementioned subtreatment element.
An engaged portion on the main treatment element side provided by said main treatment element.
An engaged portion on the head section side provided by the aforementioned head section.

[Claim 5]
The massager according to claim 4, wherein the aforementioned engagement part is provided by the aforementioned subtreatment element, enabling a free change of an engagement state and an engagement release state with an engaged portion on the aforementioned said main treatment element and head section side and is energized by engaging direction with an engaged portion on the aforementioned said main treatment element and head section side.
[Claim 6]
The massager according to claim 5 provided with a release maintenance means for maintaining an engagement release state, while the aforementioned engagement part is engaging with neither of an engaged portion on the aforementioned said main treatment element and head section side.
[Claim 7]
The massager according to claim 4, wherein engagement of the aforementioned engagement part and an engaged portion on the aforementioned head section side is performed by the other end side of a movable range of the aforementioned subtreatment element.
[Claim 8]
The massager according to claim 4 provided with a release means for releasing an engagement state with an engaged portion on the aforementioned aforementioned engagement part, said main treatment element, and head section side.
[Claim 9]
The massager comprising according to claim 8:
An operating part operated in the direction to which it moves when the aforementioned release means is projected and provided from the aforementioned head section and the aforementioned engagement part releases engagement with an engaged portion on the aforementioned said main treatment element and head section side.
A release part which moves the aforementioned engagement part to the aforementioned releasing direction with movement of the aforementioned operating part.

[Claim 10]

The massager according to claim 9 characterized by a thing to which the aforementioned release part responded to a rotation locus of the aforementioned engagement part accompanying rotation of the aforementioned subtreatment element, and which is formed circularly.

[Claim 11]

Claim 1, wherein the aforementioned subtreatment element is energized in the direction which comes out of the aforementioned head section, Claim 2, Claim 3, Claim 4, Claim 5, Claim 6, Claim 7, Claim 8, the massager according to claim 9 or 10.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[Field of the Invention]
[0001]
the present invention is free medical treatment, when it is related with a massager and especially a treated patient strikes and does massage free medical treatment with a stock -- it is related with the massager which can switch and use the range.
[Background of the Invention]
[0002]
using the driving means of a solenoid, a motor, etc. in the conventional hand-held massager -- free medical treatment -- carrying out the both-way drive of the part, and striking to a treated patient -- a massage -- there are some which give free medical treatment -- one free medical treatment -- the composition which drives a part by one driving means is common. thI3 general composition -- free medical treatment -- the range and free medical treatment -- the problem that feeling is single and a massage effect is monotonous occurs -- a solution of this problem 3ake,
1) a plurality of free medical treatment -- parts and these free medical treatment -- the composition [following [2], [4]] provided with the driving means which drives a part individually
2) a plurality of free medical treatment -- a part, one driving means, and a plurality of free medical treatment -- the composition [following [1], [3], [5], [6]] provided with a means to transmit driving force to a part
What was said is proposed.
[1] Composition which was made to perform free medical treatment (vibration/beat) which changes the hand of cut of the output shaft of a rotary drive, and transmits power only to a specific system with a one way clutch according to a hand of cut from the power transmission part of multi systems, and from which plurality differs by one set (for example, see Patent Document 1).
[2] Composition which gave the stimulus as installed the pair of flexible region which does "operating identically" to the inside of a body head side by side, connected a contact portion with each flexible region and straddled from both sides of the affected part (for example, see Patent Document 2).
[3] without it provides two treatment elements by one solenoid made to move reciprocately and increases a solenoid -- free medical treatment -- the composition (for example, see Patent Document 3) to which it was made for the range to become wide.
[4] Composition which was made to perform a point / soft massage without having consisted of a first treatment element, a second treatment element surrounding this, and two driving means that drive these individually, and requiring the clearing work of a treatment element (for example, see Patent Document 4).
[5] It is supported by the protruding part for parts with which the driving shaft was connected, and the elastic supporting part provided by the driving shaft, And composition from which it was made to be vibration of the protruding part for parts transmitted when it had the protruding part for wide range slidably arranged to the driving shaft, it pressed lightly on the human body and vibration of the both sides of the object for parts and the protruding part for wide range pressed strongly (for example, see Patent Document 5).
[6] long free medical treatment -- free medical treatment of a part -- width -- free medical treatment long so that change is possible -- providing a subtreatment element on both sides of a part, and in the lower rotating position of a subtreatment element, while connecting with a long treatment element and carrying out an alignment drive, Composition where is connected with a housing in an upper rotating position, and only a long treatment element drives and which could be made to do wide / chopper **** (for example, see Patent Document 6).
[Patent document 1] JP H6 - 50641U
[Patent document 2] JP H7 - 1929U
[Patent document 3] JP H7 - 59832A
[Patent document 4] JP H9 - 253148A
[Patent document 5] JP H10 - 234804A
[Patent document 6] JP 2000 - 350765A
[Description of the Invention]
[Problem to be solved by the invention]
[0003]
however -- in the above-mentioned proposal -- about 1, it is free medical treatment about a driving means -- the free medical treatment which drives in order to have only the number of parts -- although a part can appropriately be chosen, the problem that a massager becomes heavy and largely expensive occurs.
[0004]
In [although a driving means can solve the problem of 1 only by one piece about 2)] composition [1], the free medical treatment which drives according to a motor rotation

direction -- a plurality of [moreover] free medical treatment with a complicated structure provided with the one way clutch in order to choose a part -- since the part is provided by the both side surfaces of the massager -- free medical treatment -- whenever it switches a part, it is necessary to have a massager again in composition [3] -- free medical treatment of plurality (two pieces) -- since a part always drives alternation or simultaneous, the monotony of a massage effect seldom improves. If the press degree to a human body is changed, in composition [5] although a wide range stimulus and the stimulus to a part can be switched, the time of the stimulus to a part -- the free medical treatment for wide range -- a part is the structure of abutting a human body, the difference in a massage effect is not clear and its structure for the change of the range is complicated. furthermore -- in composition [6] -- long free medical treatment -- it is the composition of switching the width of a part -- long free medical treatment -- the case where width of a part is narrowed -- free medical treatment -- the length of the range is still long -- free medical treatment -- change of the range is not clear.
[0005]
the present invention is what was made paying attention to such a problem -- free medical treatment -- the range and free medical treatment -- it aims at providing the massager which realizes composition to which an interval is changed clearly by smallness suitable for a hand carry type, and lightness.
[Means for solving problem]
[0006]
In order to achieve the aforementioned object, the massager of the present invention, A head section, and the main treatment element and the subtreatment element which were provided so that the projecting amount from a head section might be made variable, it is free medical treatment to the main treatment element -- it had the driving means to operate and the engagement means which makes a subtreatment element removable selectively at the main treatment element, and the main treatment element and the subtreatment element were installed in the longitudinal direction of a head section side by side
[0007]
Since the subtreatment element is selectively installed in the longitudinal direction of removable and a head section side by side to the main treatment element according to this composition, it is free medical treatment in the state where the subtreatment element was engaged with the main treatment element -- if it operates -- free medical treatment -- the range is free medical treatment in the state where become the length which doubled the main treatment element and the subtreatment element, and it does not engage a subtreatment element with the main treatment element, if it operates, only the main treatment element is free medical treatment -- operating -- free medical treatment -- the range becomes shorter than the case where a subtreatment element is engaged with the main treatment element -- free medical treatment -- the range and free medical treatment -- an interval can be changed clearly.
[0008]
a subtreatment element -- free medical treatment of the main treatment element -- it is suitable to make it the one end side which has a larger movable range than the movable range in operation and from which the projecting amount from the head section in the movable range concerned serves as the maximum correspond to the one end side from which the projecting amount from the head section in the movable range of the main treatment element serves as the maximum. the state which does not engage a subtreatment element with the main treatment element, i.e., the main treatment element, is free medical treatment by this -- when operating, a subtreatment element does not contact a user's treated part -- free medical treatment -- the range and free medical treatment -- an interval can be changed more clearly.
[0009]
The main treatment element and the subtreatment element are individually supported pivotably by the one end side of the head section, respectively, enabling free rotation, and, as for the rotational center, it is suitable to lie at right angles to the longitudinal direction of a head section. Thereby, the composition of each treatment element can be simplified and smallness and lightness suitable for a hand carry type can be realized.
[0010]
The engagement part by which the engagement means was provided by the subtreatment element, and the engaged portion on the main treatment element side provided by the main treatment element, the time of consisting of an engaged portion on the head section side provided by the head section, and the engagement part engaging with the engaged portion on the main treatment element side -- the main treatment element and a subtreatment element -- integrally -- free medical treatment -- while it operates and the engagement part is engaging with the engaged portion on the head section side, only the main treatment element is free medical treatment -- it is suitable that it is made to operate. according to this composition -- only the main treatment element is free medical treatment -- since a subtreatment element engages with a head section and it does not operate when operating, it can prevent an unpleasant vibration and noise occurring.
[0011]
As for an engagement part, it is suitable for a subtreatment element to provide, enabling a free change of an engagement state and engagement release state with an engaged portion on the main treatment element and head section side, and to be energized by the engaging direction with the engaged portion on the main treatment element and head section side. Thereby, engaging and releasing to a subtreatment element and the main treatment element can be realized easily, and shift to a positive engagement state can be realized.
[0012]
While the engagement part is engaging with neither of the engaged portion on the main treatment element and head section side, it is suitable to have the release maintenance means for maintaining an engagement release state. According to this composition, when shifting to the state of engaging with either, it becomes unnecessary operating [which changes an

engagement part into an engagement release state anew] the engagement part energized by the engaging direction to the engaged portion from the state where the subtreatment element is engaging with neither of the engaged portion of the main treatment element and a head section.

[0013]

As for the engagement of an engagement part and the engaged portion on the head section side, it is suitable to be carried out by the other end side of the movable range of a subtreatment element. According to this composition, engagement of a subtreatment element and a head section can be realized easily and reliably.

[0014]

It is suitable to have the release means for releasing an engagement state with the engaged portion on the engagement part, main treatment element, and head section side. As for a release means, it is suitable to have an operating part operated in the direction to which it moves when it projects and provides from a head section and an engagement part releases engagement with the engaged portion on the main treatment element and head section side, and a release part which moves an engagement part to a releasing direction with movement of an operating part. Thereby, engagement release of an engagement part and an engaged portion can be realized easily and reliably.

[0015]

As for a release part, it is suitable to be formed [which responded to the rotation locus of the engagement part accompanying rotation of a subtreatment element] circularly. The movement magnitude of the operating part at the time of releasing the engagement of an engagement part and an engaged portion and the difference of power required for operation do not arise in the case where this is engaging with the case where the subtreatment element is engaging with the main treatment element, and the head section.

[0016]

As for a subtreatment element, it is suitable to be energized in the direction which comes out of a head section. since a subtreatment element shifts to the state of engaging with the main treatment element, automatically by this even if it is in the state where the engagement part is engaging with neither the main treatment element nor the head section -- free medical treatment -- the range and free medical treatment -- the change of an interval can be realized easily and reliably.

[Effect of the Invention]

[0017]

since according to this invention free medical treatment in the state where the main treatment element and the subtreatment element were located in a line with the longitudinal direction of the head section, or free medical treatment only by the main treatment element can be chosen and can be performed -- free medical treatment -- the range and free medical treatment -- an interval can be changed clearly. And such composition is realizable by smallness and lightness suitable for a hand carry type.

[Best Mode of Carrying Out the Invention]

[0018]

Hereinafter, the massager of the present invention is described based on an embodiment.

[0019]

The appearance perspective view of the massager in the state where folded up the front view of the massager of Fig.1 to Fig.1, and it folded up the head section for the appearance perspective view in an anticipated-use state of the massager concerning the embodiment to Fig.2 again is shown in Fig.3, and the front view of the massager of Fig.3 is shown in Fig.4. However, the details of appearance shape have some difference by Fig.1, and Fig.2 - Fig.4.

[0020]

This massager 1 consists of the main part 2 grasped by hand at the time of use, and the head section 3 connected with this main part 2 by the shank 4 rotatable. Towards the main part 2 side, in about 85 degrees, the head section 3 is bendable and causes the head section 3 like Fig.1 and Fig.2 at the time of use, and the head section 3 is folded up like Fig.3 and Fig.4 at the time of non-use (when keeping). Either of the folded state of the busy condition of Fig.1 and Fig.2, Fig.3, and Fig.4 requires a lock for the head section 3 by the shank 4, and lock and its release are performed by facing forcibly, and bringing the main part 2 and the head section 3 close, or detaching them.

[0021]

The electric power switch 7, the program / manual changeover switch 8, and the program selection / speed adjusting dial 9 are provided by the main part 2. the electric power switch 7 -- the change of the ON/OFF of a power supply, and free medical treatment -- it is for changing strength of operation (beat operation). A program / manual changeover switch 8 is for switching the programing operation and manual operation which were set up preliminarily. Program selection / speed adjusting dial 9 is for switching eight kinds of programs set up preliminarily at the time of programing operation, and switching speed to eight steps at the time of manual operation. The main part 2 incorporates the circuit board (not shown) etc. which mounted several kinds of electronic component.

[0022]

The head section 3 is formed in form long and slender in the direction which intersects perpendicularly with the shank 4, has the outer housing L11, the outer housing R12, and the outer housing U13, fitting of the outer housing L11, R12, and U13 is carried out each other as outer housing, and is integrally assembled with a screw, and shines. The main treatment element 60 and the subtreatment element 80 are appearing so that it may install in the longitudinal direction of this head section 3 (outer housing) side by side, and free medical treatment is given in a treated patient's part (for example, shoulder) by in-and-out operation (beat operation) to the head section 3 of this main treatment element 60 and the subtreatment element 80.

[0023]
free medical treatment like Fig.5 inside the outer housing which comprises the outer housing L11, R12, and U13 -- the mechanism 15 is stored.
[0024]
free medical treatment -- the mechanism 15 is structure as shown in Fig.6 - Fig.8 with an exploded perspective view, and has the internal housing L21 (Fig.6) and the internal housing R22 (Fig.7) of illustrated form [like]. Fitting of this pair of internal housing L21 and R22 is carried out each other as internal housing, and it assembles integrally with a screw and shines. Several kinds of parts are attached to the internal housing which comprises this pair of internal housing L21 and R22, and this internal housing is arranged in the outer housing which comprises the outer housing L11, R12, and U13.
[0025]
in Fig.6 -- free medical treatment -- the mechanism 15 has the solenoid assembly 40 as a driving means. The solenoid assembly 40 is provided with the following.
Support plate 41.
The parts 42, such as a bobbin coil arranged inside this support plate 41.
The plunger 43 inserted in the center of the part 42 movable.
The lead 50 which extends from the part 42 is connected to the circuit board provided by main part 2 inside. The buffer rubber 44 for an impact absorption and silence is attached to the one end part (upper end part) of the plunger 43, and the buffer rubber 45 for attachment, an impact absorption, and silence is attached to the lower end part of the support plate 41.
[0026]
While the pair of plunger connector 46 is fixed to the other end (lower end part) of the plunger 43 by a screw and the nut with the aspect which pinches the connector rubber 47, the main treatment element connector 48 is attached to the connector rubber 47 by fitting. It is fixed with a screw while fitting of the main treatment element connector 48 is carried out to the inside of the main treatment element 60 (Fig.7). Where the main treatment element connector 48 is fixed to the inside of the main treatment element 60, even the plunger connector 46 is substantially settled in the inside of the main treatment element 60. The spring 49 is fitted in the other end of the plunger 43, and this spring 49 always energizes the plunger 43, i.e., the main treatment element 60, in the direction which comes out of the head section 3. The stroke of reciprocating movement of the plunger 43 is about 6 mm, for example.
[0027]
The solenoid assembly 40 is stored in the solenoid assembly accommodation part 23 provided by the internal housing L21 and R22 to the internal housing L21 and R22. Specifically, it is that fitting of the buffer rubber 45 of the solenoid assembly 40 is carried out to the fitting groove 24 of the internal housing L21 and R22, and the solenoid assembly 40 is attached to the internal housing L21 and R22. While the vent 25 is formed in the internal housing L21 and R22, the vent 14 (Fig.1) is formed also in the outer housing L11 and R12, and the heat which occurs from the solenoid assembly 40 comes to escape easily to the outside of the massager 1 through those vents 25 and 14.
[0028]
The main treatment element 60 (Fig.7) is provided with the following.
Rubber which was placed between the internal housing L21 and R22, and was put outside (not shown).
The cavity part 61 which stores the plunger connector 46, the connector rubber 47, and the main treatment element connector 48 of the above-mentioned solenoid assembly 40.
This main treatment element 60 has the pair of arm 62 which keeps an interval and opposes, and the hook receiver 70 (engaged portion on the main treatment element side) is attached to the boss 63 provided inside one arm 62 with a screw. The hook receiver 70 has the fitting groove 70a into which the point side of the bar 91 of the below-mentioned fixing hook 90 (engagement part) fits removablely selectively. An engagement means consists of this hook receiver 70 and fixing hook 90.
[0029]
The subtreatment element 80 (Fig.8) is provided with the following.
Rubber which was placed between the pair of arms 62 of the main treatment element 60, and was put outside (not shown).
Arm 81.

[0030]
To the through-hole 82 formed in the proximal end of the arm 81 of the subtreatment element 80, and the through-hole 64 formed in each proximal end of the pair of arm 62 of the main treatment element 60, The shaft 65 is inserted in and the main treatment element 60 and the subtreatment element 80 are supported pivotably to the internal housing L21 and R22 (outer housing L11 and R12) by the both ends of this shaft 65 being inserted in the boss 26 provided at the end face side of the internal housing L21 and R22, enabling free rotation. Thereby, rotation of the main treatment element 60 and the subtreatment element 80 is individually attained, respectively around the center of the axis which intersects perpendicularly to the longitudinal direction of the head section 3.
[0031]
In the shaft 65, the spring 66 is fitted in inside the arm 81 of the subtreatment element 80, and this spring 66 is always energized in the direction (direction which comes out of the head section 3) which takes out the subtreatment element 80 outside from between the pair of arms 62 of the main treatment element 60. The spring 66 is shown by Fig.7 inside the pair of arm 62 of the main treatment element 60. In the shaft 65, it is interposed between the portions between the arm 62 of the main treatment element 60, and the arm 81 of the subtreatment element 80 by the washer 67 so that the main treatment element 60 and the subtreatment element 80 may rotate smoothly respectively individually.

[0032]
The fixing hook 90 which consists of parts as shown in Fig.8 is attached to the subtreatment element 80. A cross sectional view [in / in / for a front view / to Fig.10 / Fig.11 / for a plan view (plan) / to Fig.12 / line A-A of Fig.11] is shown for those perspective views in Fig.9. However, basic constitution is the same although form differs a little by what is shown in Fig.8, and the thing shown in Fig.9 - Fig.12.
[0033]
The fixing hook 90 is provided with the following.
Bar 91.
Forked axopodium 92 in which the through-hole 93 was formed.
The shaft 94 is inserted in the through-hole 93 of the axopodium 92 of this fixing hook 90, and this shaft 94 is supported by the shaft case 95. It is fixed with the screw 96 while fitting of the shaft case 95 is carried out to the inside of the subtreatment element 80. Thereby, it projects from the subtreatment element 80, and the fixing hook 90 becomes rotatable in a movable range around the center of the shaft 94, and can enable the change of an engagement state and an engagement release state to the hook receiver 70 and the fitting groove 34 inside the internal housing R22 mentioned below. It is interposed between the portions between the subtreatment element 80 and the axopodium 92 of the fixing hook 90 in the shaft 94 by the washer 97 for making rotation of the fixing hook 90 smooth. The spring 98 is fitted in the portion of the shaft 94 inside the forked axopodium 92, and this spring 98 is always energized in the direction of the aforementioned hook receiver 70 fixed to the main treatment element 60 in the fixing hook 90.
[0034]
On the other hand, Fig.7, Fig.13 (front view which looked at the internal housing R22 from the inside where the subtreatment element 80 is fixed to the main treatment element 60), Fig.14 (essential part expansion perspective view in a state of Fig.13), Fig.15 (in part fracture front view in a normal state when the subtreatment element 80 is fixed to the main treatment element 60), Fig.16 (in part fracture front view in the state where the main treatment element 60 withdrew most in the case of Fig.15), Fig.17 (in part fracture front view in a normal state when the subtreatment element 80 is fixed to the internal housing R22), Fig.18 (in part fracture front view in the state where the main treatment element 60 withdrew most in the case of Fig.17), As shown in Fig.19 (essential part expansion side view when the subtreatment element 80 is fixed to the main treatment element 60), and Fig.20 (essential part expansion side view when the subtreatment element 80 is fixed to the internal housing R22), the release-lever link 110 for pushing the fixing hook 90 is provided with the following.
The circular lever 111 (release part).
Installation piece 112.

[0035]
While fitting of that installation piece 112 is carried out to the fitting part 30 provided inside the internal housing R22, that one end part 110a is inserted in the boss 31 inside the internal housing L21, and, as for this release-lever link 110, the other end 110b is inserted in the through-hole 32 of the internal housing R22. The other end 110b is projected from the through-hole 32 of the internal housing R22 (Fig.5), and the button 115 (operating part) for release operation shown in Fig.1 - Fig.4 is attached to this projection part. A release means consists of the release-lever link 110 and the button 115 for release operation.
[0036]
The lever 111 of the release-lever link 110 is inserted in space 99 (Fig.9) formed with the fixing hook 90 and the bar 91. Therefore, if the button 115 which came out of the outer housing R12 is pushed, by the lever 111, the fixing hook 90 will resist the energization force of the spring 98, and will move to the hook receiver's 70 opposite side.
[0037]
If the bar 91 of the fixing hook 90 fits into the hook receiver's 70 fitting groove 70a on the other hand, (Fig.13 - Fig.16, Fig.19), If the subtreatment element 80 will be fixed to the main treatment element 60 and the bar 91 fits into the fitting groove 34 (engaged portion on the head section side) formed inside the internal housing R22, and the fitting groove 35a of the below-mentioned guide rail 35 (Fig.17, Fig.18, Fig.20), The subtreatment element 80 will fix to the internal housing R22.
[0038]
The subtreatment element 80 makes the position where a maximum fixed position and the bar 91 fit into the hook receiver 70 the position where the bar 91 fits into the fitting groove 34 a minimum fixed position, and becomes rotatable among both fixed positions. In near a minimum fixed position, the bar 91 and the hook receiver 70 fit in, and the subtreatment element 80 engages with the main treatment element 60, and operates integrally. therefore, the minimum fixed position of the subtreatment element 80 -- free medical treatment of the main treatment element 60 -- the projecting amount from the head section of the movable range in operation corresponds to the position used as the maximum. the maximum fixed position of the subtreatment element 80 -- free medical treatment of the main treatment element 60 -- it is set up up rather than the upper limit position of the movable range in operation, and the subtreatment element 80 has a larger movable range than the movable range of the main treatment element 60. The fitting will be released, if the button 115 is pushed after the bar 91 has fitted into the fitting groove 34 or the hook receiver 70.
[0039]
If the button 115 is pushed after the bar 91 has fitted into the hook receiver 70, the subtreatment element 80 tends to move in the direction which comes out of the head section 3 by the energization of the spring 66, but. After the bar 91 has separated from the hook receiver 70, since the stopper 68 (Fig.7) provided by one arm 62 of the main treatment element 60 is abutted, the fixing hook 90 does not rotate the subtreatment element 80 across a minimum

fixed position.
[0040]
Specifically, after the bar 91 has fitted into the hook receiver 70, the button 115 is pushed, and if the energization force of the spring 66 is resisted and the subtreatment element 80 is pushed in in the head section 3, the bar 91 will fit into the fitting groove 34 of the internal housing R22. Thereby, the subtreatment element 80 is fixed to the internal housing R22, and the subtreatment element 80 is locked in the state where it withdrew most in the head section 3. in this state, only the main treatment element 60 is free medical treatment -- it operates. If the button 115 is pushed on the contrary after the bar 91 has fitted into the fitting groove 34 of the internal housing R22, the subtreatment element 80 will be rotated in the direction projected from the head section 3 by the energization of the spring 66, and the bar 91 will fit into the hook receiver 70. Thereby, the subtreatment element 80 is fixed to the main treatment element 60, and the subtreatment element 80 is locked in the state where it projected most from the head section 3. in this state, the main treatment element 60 and the subtreatment element 80 are free medical treatment -- it operates.
[0041]
When the subtreatment element 80 moves in the inside of a movable range, inside the internal housing R22, the gulde rail 35 is provlded so that it may be reliably locked in elther the above-mentioned maximum fixed position or a minimum fixed position. In the state where the guide rail 35 has the subtreatment element 80 between a maximum fixed position and a minimum fixed position, In order to maintain the state (engagement release state) where the bar 91 of the fixing hook 90 resisted the energization force of the spring 98, and rotated to the hook receiver's 70 opposite side, It is formed so that the point extended in the transverse direction of the bar 91 of the fixing hook 90 may be contacted, and the guide rail 35 constitutes a release maintenance means.
[0042]
The state where pushed the button 115 and the bar 91 was released by this from engagement with the fitting groove 34 of the hook receiver 70 or the internal housing R22, It will be held until the subtreatment element 80 arrives at either a maximum fixed position or a minimum fixed position, and the subtreatment element 80 is reliably locked in either a maximum fixed position or a minimum fixed position. This guide rail 35 has the fitting groove 35a into which the point of the bar 91 fits in the maximum fixed position of the subtreatment element 80, and is performing the role which fixes the bar 91, i.e., the subtreatment element 80, to a maximum fixed position with the fitting groove 34.
[0043]
Although the shape of a circular arc is presented like Fig.13 - Fig.18, the lever 111 of the release-lever link 110 which, on the other hand, releases the lock of the fixing hook 90, the ** which is not called at the position of the fixing hook 90 in order that this may suppress generating of an unnecessary moment -- the lever 111 -- as much as possible -- method ** of right and left of the pivot block 90a of the fixing hook 90 -- it is for making a center portion contact substantially. That is, although the fixing hook 90 draws the circular locus centering on the through-hole 82 of the subtreatment element 80 with rotation between the maximum fixed position of the subtreatment element 80, and a minimum fixed position, the lever 111 is extending so that it may be along this circular locus. thereby -- the lever 111 -- irrespective of the position of the fixing hook 90 -- method ** of right and left of the pivot block 90a of the fixing hook 90 -- since a center portion is contacted substantially, an unnecessary moment which twists the fixing hook 90 does not occur. And the amount of displacement of the lever 111 when moving or stopping the subtreatment element 80 to the position (position of the subtreatment element 80) of the fixing hook 90 may not change, but certain force and constant amount may be sufficient as the pressing operation of the button 115. In these results, the fixing of the subtreatment element 80 to operation of the button 115 and the response of fixing release become good.
[0044]
alike [in the main treatment element 60 and the subtreatment element 80] in the massager 1 constituted in this way -- free medical treatment -- in order to make it contribute to operation, the hook receiver 70 is made to do engagement of the fixing hook 90, and the subtreatment element 80 is fixed to the main treatment element 60. When the fixing hook 90 has fitted into the fitting groove 34 of the internal housing R22 at this time, If the button 115 is pushed, a lock will be released, and it rotates in the direction which the subtreatment element 80 projects from the head section 3 according to the energization force of the spring 66 concerning the subtreatment element 80, and the fixing hook 90 engages with the hook receiver 70. In a normal state when this subtreatment element 80 is integrally fixed to the main treatment element 60, the main treatment element 60 and the subtreatment element 80 are projected from the head section 3 with the spring 49 of the solenoid assembly 40 (Fig.15).
[0045]
Here, if the electric power switch 7 is turned ON, in connection with the plunger 43 of the solenoid assembly 40 resisting the energization force of the spring 49, and withdrawing, the main treatment element 60 and the subtreatment element 80 will move in the direction which enters in the head section 3 (Fig.16). in the plunger 43 moving reciprocately, the main treatment element 60 and the subtreatment element 80 repeat in-and-out operation -- free medical treatment -- free medical treatment (operation to strike) is given to a part (for example, shoulder). this free medical treatment -- crossing to the long range of linear shape in operation, since the main treatment element 60 and the subtreatment element 80 are located in a line with straight line shape at the longitudinal direction of the head section 3 -- free medical treatment -- operation is performed.
[0046]
The button 115 may be pushed and the subtreatment element 80 may be pushed in in the head section 3 to use only the main treatment element 60. Then, the fixing hook 90 shifts to an

engagement state with the fitting groove 34 of the internal housing R22 from an engagement state with the hook receiver 70, and the subtreatment element 80 is fixed to the internal housing R22. In a normal state when this subtreatment element 80 was integrally fixed to the internal housing R22, although the main treatment element 60 was projected from the head section 3 with the spring 49 of the solenoid assembly 40, the subtreatment element 80 has withdrawn in the head section 3 (Fig.17).

[0047]

When it is made to abut from the upper part and free medical treatment is being given in the massager 1 to treated parts, such as a shoulder, the subtreatment element 80 is pushed in in the head section 3 only by pushing the button 115 for release operation. Since the lock of the fixing hook 90 and the hook receiver 70 is released by pushing the button 115 for release operation and the subtreatment element 80 and the head section 3 will be in the state which can be rotated freely relatively, this is. It is for rotating relatively so that the head section 3 may descend by the weight to the subtreatment element 80 which the lower surface supported to treated parts, such as a shoulder. At this time, with the guide rail 35, the state where the bar 91 of the fixing hook 90 was released from engagement with the fitting groove 34 of the hook receiver 70 or the internal housing R22 is held until the subtreatment element 80 arrives at a maximum fixed position. Therefore, the fixing hook 90 can shift to an engagement state with the fitting groove 34 of the internal housing R22 reliably, after engagement with the hook receiver 70 is released.

[0048]

Here, if the electric power switch 7 is turned ON, in connection with the plunger 43 of the solenoid assembly 40 resisting the energization force of the spring 49, and withdrawing, only the main treatment element 60 will move in the direction which enters in the head section 3 (Fig.18). by only the main treatment element 60 repeating in-and-out operation, it is free medical treatment -- free medical treatment (operation to strike) is given to a part (for example, shoulder). in this case -- only the main treatment element 60 is free medical treatment -- since it contributes to operation -- it is free medical treatment only to the short range of linear shape -- operation is performed.

[0049]

thus -- if the button 115 is pushed according to this massager 1 and the subtreatment element 80 is taken out from the head section 3 -- free medical treatment of the wide range -- it being able to change into operation and, if the button 115 is pushed and the subtreatment element 80 is pushed in in the head section 3 -- free medical treatment of the narrow range -- it can change into operation and can make variable the length of the treatment element (the main treatment element 60 and the subtreatment element 80) extended to the longitudinal direction of the head section 3. and free medical treatment -- the range and free medical treatment -- the composition to which an interval is changed clearly is realizable by smallness and lightness suitable for a hand carry type.

[Brief Description of the Drawings]

[0050]

A [FIG. 1] It is an appearance perspective view in an anticipated-use state of the massager concerning an embodiment.

A [FIG. 2] It is a front view of the massager of Fig.1.

A [FIG. 3] It is an appearance perspective view in the state where the head section of the massager was folded up.

A [FIG. 4] It is a front view of the massager of Fig.3.

A [FIG. 5] the free medical treatment stored in the inside of the outer housing of the head section of the massager -- it is an appearance perspective view showing a mechanism.

A [FIG. 6] free medical treatment of Fig.5 -- it is an exploded perspective view showing some mechanisms.

A [FIG. 7] free medical treatment of Fig.5 -- it is an exploded perspective view showing a part for the remainder of a mechanism.

A [FIG. 8] free medical treatment of Fig.5 -- it is an exploded perspective view of a mechanism showing a part for the remainder further.

A [FIG. 9] It is a perspective view of the subtreatment element in the massager.

A [FIG. 10] It is a front view of the subtreatment element in the massager.

A [FIG. 11] It is a plan view (plan) of the subtreatment element in the massager.

A [FIG. 12] It is a cross sectional view in line A-A of Fig.11.

A [FIG. 13] In the massager, it is the front view which looked at internal housing from the inside where a subtreatment element is fixed to the main treatment element.

A [FIG. 14] In the massager, it is an essential part expansion perspective view in the state of Fig.13.

A [FIG. 15] in the massager, it can set to a normal state when a subtreatment element is fixed to the main treatment element -- it is a fracture front view in part.

A [FIG. 16] the state where the main treatment element withdrew most in the massager in the case of Fig.15

it kicks -- it is a fracture front view in part.

A [FIG. 17] in the massager, it can set to a normal state when a subtreatment element is fixed to internal housing -- it is a fracture front view in part.

A [FIG. 18] In the massager, it can set in the state where the main treatment element withdrew most in the case of Fig.17 -- it is a fracture front view in part.

A [FIG. 19] In the massager, it is an essential part expansion side view when a subtreatment element is fixed to the main treatment element.

A [FIG. 20] In the massager, it is an essential part expansion side view when a subtreatment element is fixed to internal housing.

[Explanations of letters or numerals]

[0051]

1 Massager
2 Main part
3 Head section
4 Shank
15 free medical treatment -- a mechanism
21 and 22 internal-housing L, R
31 Fitting groove (the engaged portion on the head section side, an engagement means)
35 Guide rail (release maintenance means)
35a Fitting groove
40 Solenoid assembly
60 The main treatment element
70 Hook receiver (the engaged portion on the main treatment element side, an engagement means)
70a Fitting groove
80 A subtreatment element
90 Fixing hook (an engagement part, an engagement means)
91 Bar
110 Release-lever llnk (release means)
111 Lever (release part)
115 The button for release operation (operating part)

*** NOTICES ***

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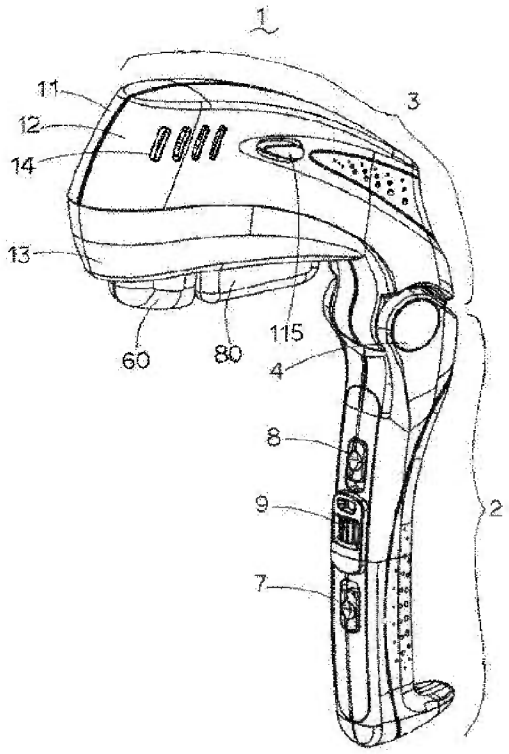
1.This document has been translated by computer. So the translation may not reflect the original precisely.

2.**** shows the word which can not be translated.

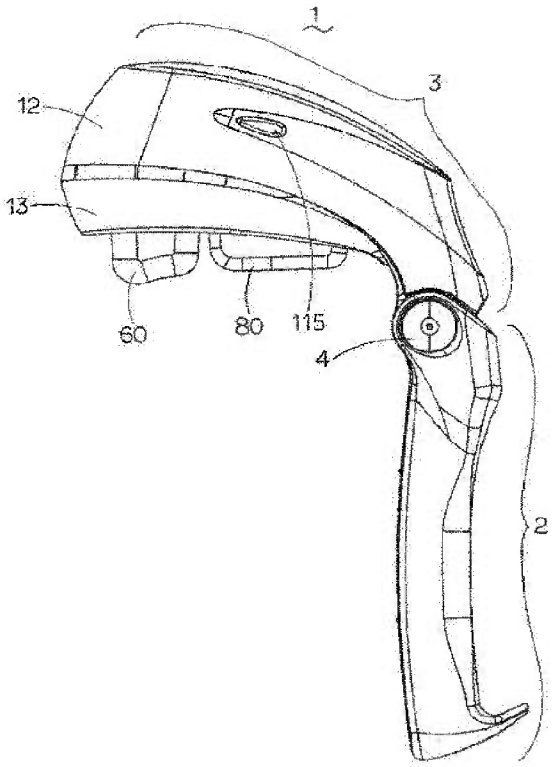
3.In the drawings, any words are not translated.

DRAWINGS

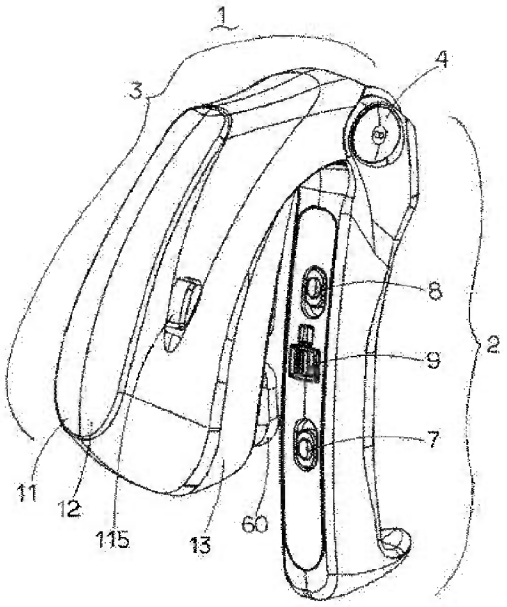
Λ [FIG. 1]



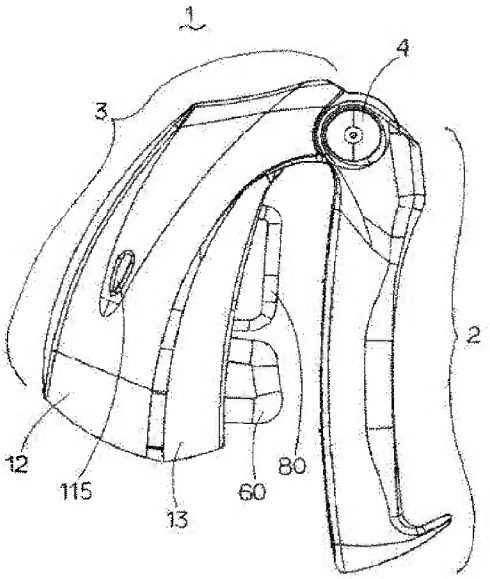
Λ [FIG. 2]



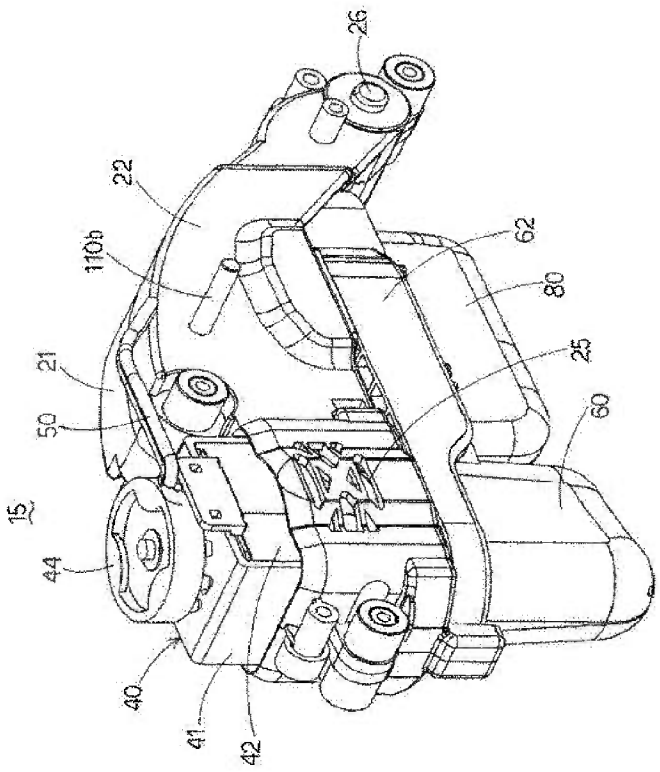
A [FIG. 3]



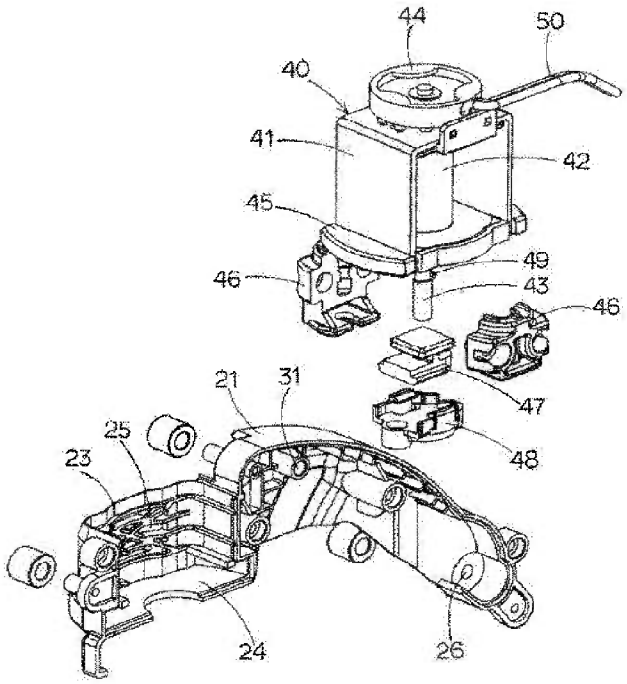
Λ [FIG. 4]



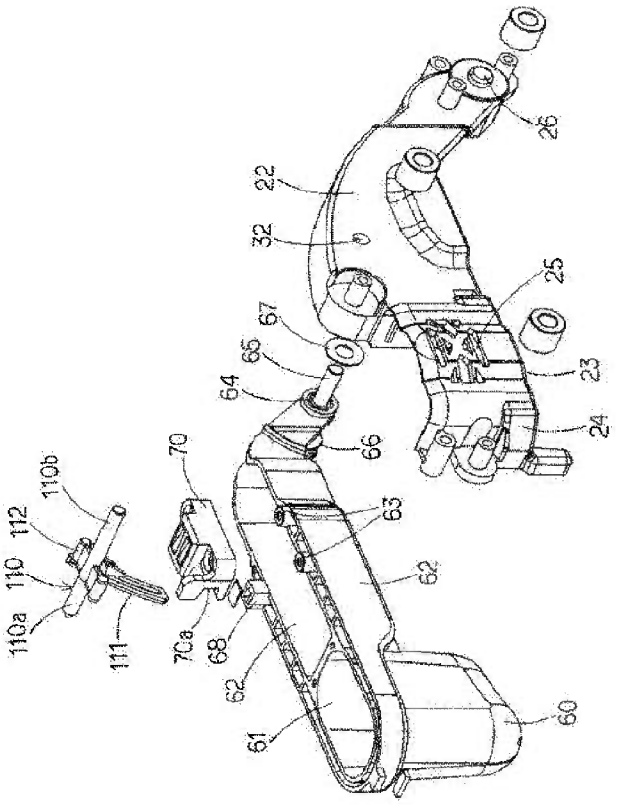
A [FIG. 5]



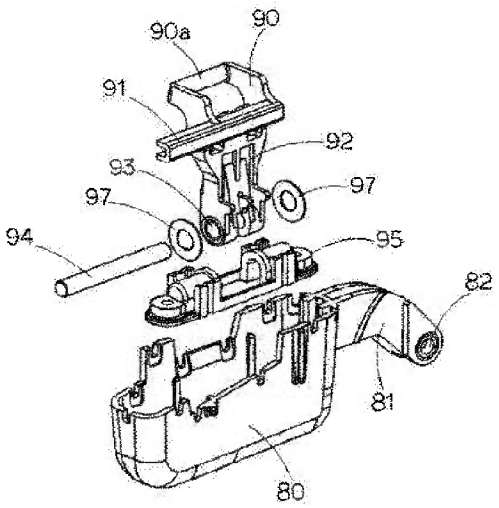
Λ [FIG. 6]

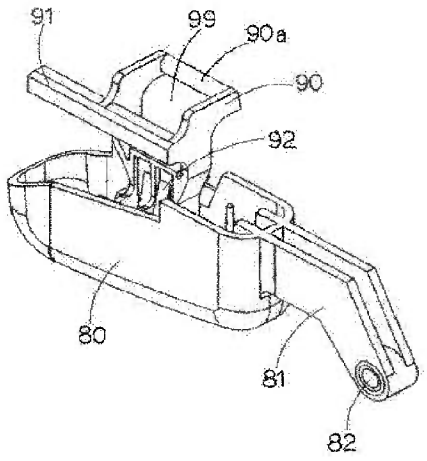


Λ [FIG. 7]


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110b
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112
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110a
70a
68
111
62
61
60

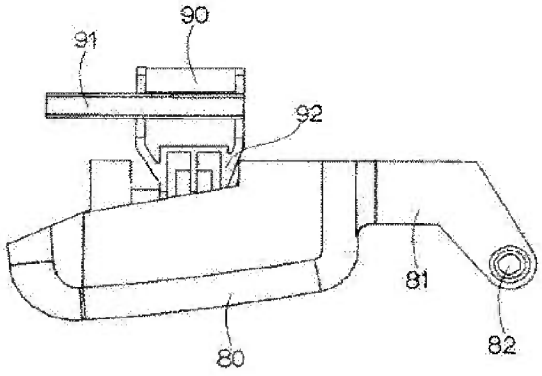
Λ [FIG. 8]

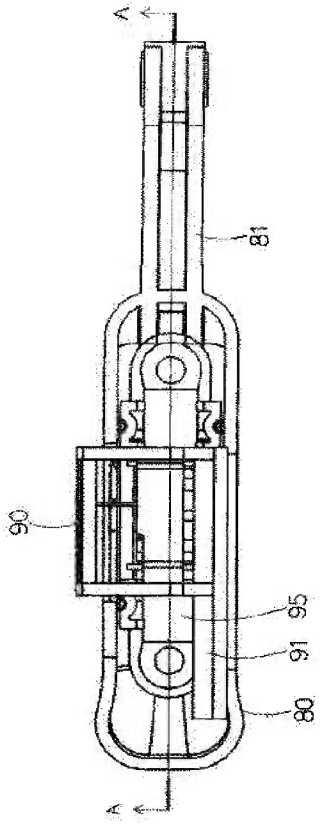

90a
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81
80



A [FIG. 9]

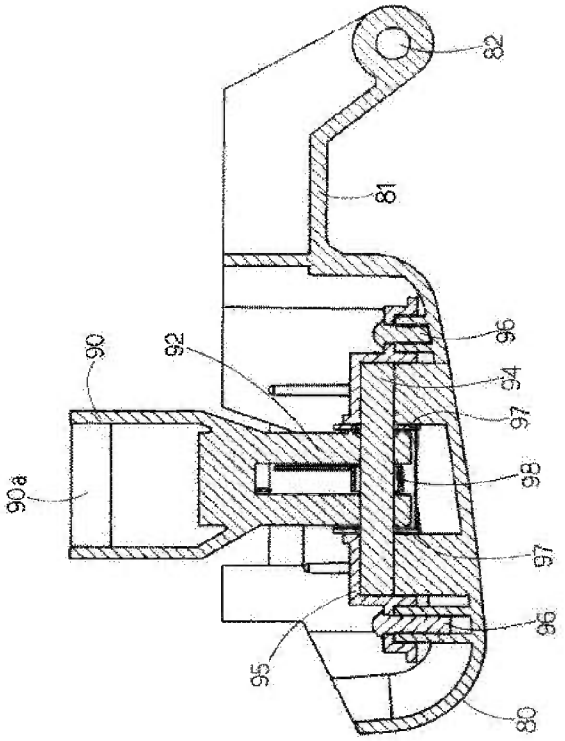
A [FIG. 10]


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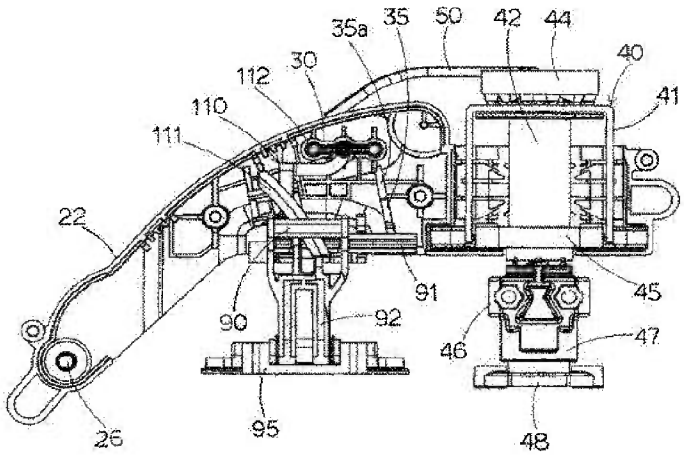


A [FIG. 11]

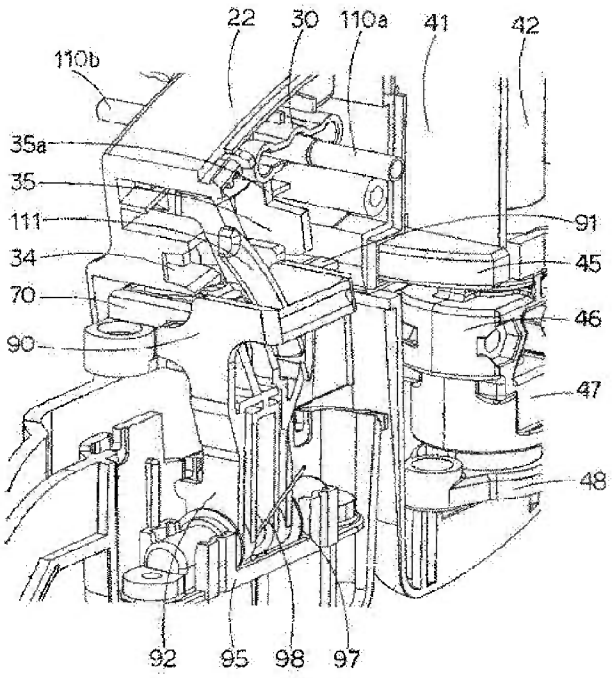
A [FIG. 12]



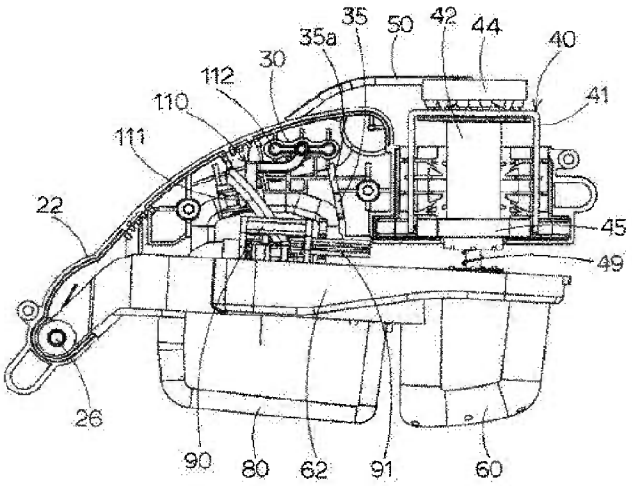
A [FIG. 13]



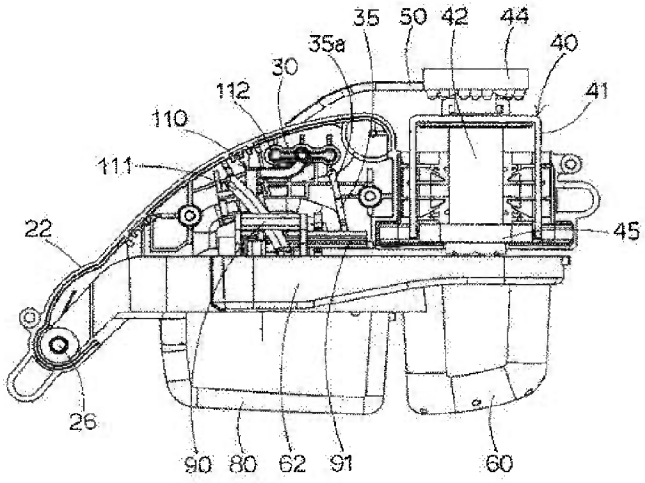
A [FIG. 14]



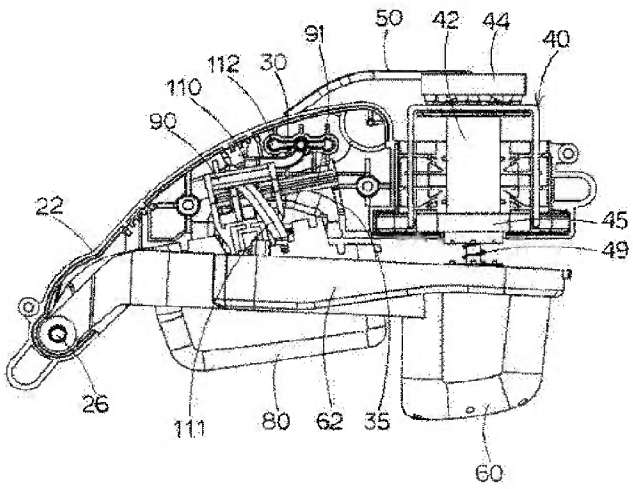
A [FIG. 15]



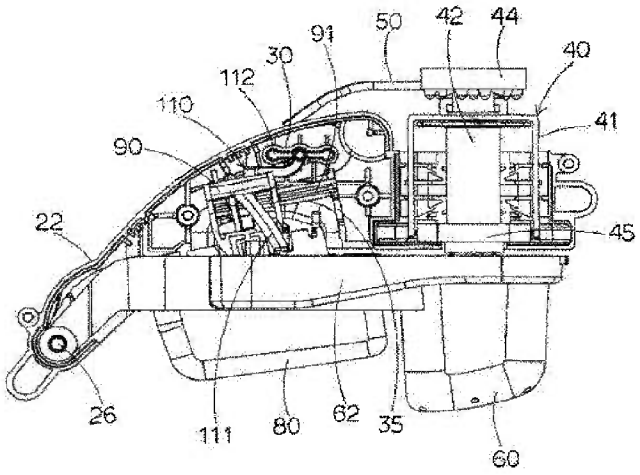
A [FIG. 16]



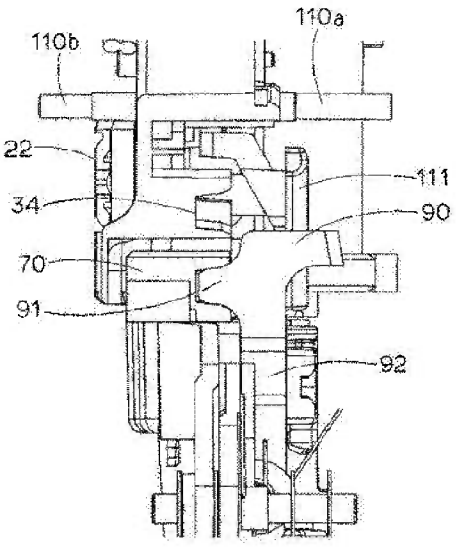
A [FIG. 17]



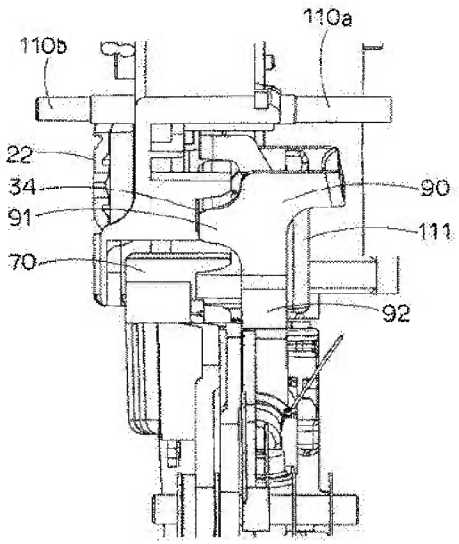
A [FIG. 18]



A [FIG. 19]



A [FIG. 20]


110a
110b
22
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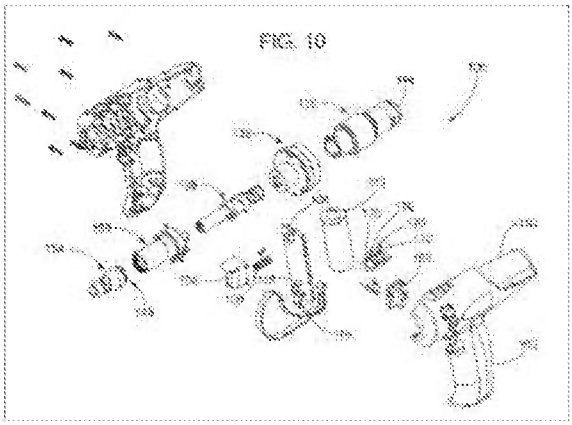
PORTABLE CHIROPRACTIC ADJUSTOR

Inventor(s):

Applicant(s):

Classification:	**- international:** ***A61H23/02; A61H39/04***
	- cooperative: **A61H1/008**; A61H2201/5043; A61H2201/5061
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A portable battery power operated chiropractic adjustor, manipulator or thruster for applying an adjustment energy to a patient through a plunger having a resilient or cushioned head with the energy applied to the plunger being supplied by non-manual sources and the impulse is adjustable or tunable along with having annunciators or indicators for preload and readiness to operate. The power source may be an internal rechargeable battery or removable rechargeable battery pack and the adjustor is DC motor operated to impart selectively single or multiple thrusts.

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VIBRATION MASSAGE APPARATUS FOR MUSCLE

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Classification: - **international:** ***A61H23/02; A61N5/06***
- **cooperative:** **A61H23/006**; **A61H23/0254**; **A61N5/0616**; A61N2005/0651; A61N2005/0652; A61N2005/0659 more

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Priority number (s): KR20110084773 20110824

Abstract of KR101123926 (B1)

PURPOSE: A vibrating muscle massage device is provided to simplify a structure of the massage device, thereby enabling users to grip and balance the massage device while in use. CONSTITUTION: A vibrating muscle massage device comprises a body (100), a motor(200), a vibration generating unit, and a gun switch(400). The vibration generating unit is composed of a vibration-rotational part(310), a vibration slide part (320), and a vibration stimulus part(330). In the vibration-rotational part, a spiral groove is formed along rotational direction from one side to the other exterior side, and one side is combined with a rotary shaft of the motor in a horizontal direction in order to help exercising the vibration slide part back and forth. The vibration slide part is combined with the spiral groove of the vibration-rotational part and horizontally exercise back and forth within a total length of the groove as the vibration-rotational part revolves. The vibration stimulus part is combined in front-end of the vibration slide part and is exposed to outside of the body in order to contact the muscles of a user and supply vibration stimulus of the vibration slide part.

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DESCRIPTION KR101123926

[0001] VIBRATION MASSAGE APPARATUS FOR MUSCLE [0002]

[0001]

BACKGROUND OF THE INVENTION 1. Field of the Invention [0001] The present invention relates to a muscle massage device for allowing mechanical vibration to be transmitted to muscles to relax muscles, and more particularly, will be.

[0002]

Mechanical vibration massage therapy is commonly used to help muscle rehabilitation.

Vibration massage therapy is applied for the purpose of treating mechanical vibration. It is designed to transmit the vibration to the human body to make a vertical wave flow, to improve the blood flow, to relax the contracted muscle tissue, Help.

[0003]

Other effects of muscle stimulation using vibration include pain relief, fat dissolving and cosmetic effects, increased blood circulation and relief of redness, and muscle relaxation.

[0004]

In the past, the vibration massage device as described above was available in hospitals or rehabilitation centers. However, in recent years, various types of muscle vibration massage devices have been commercialized, which are miniaturized to be portable as well as used at home due to technological developments and improved in performance.

[0005]

1 shows Korean Patent No. 20-0311328 entitled & quot; Muscle Stimulation Diasiole. & Quot;

[0006]

As shown in FIG. 1, the conventional muscle stimulation massage device includes an eccentric rotor having an eccentric rotation shaft formed to rotate according to rotation of a motor and a motor in a handle 1, The muscle shaft member 2 is configured such that the inner surface of the slide shaft 3 of the member 2 strikes the eccentric rotary shaft and the slide shaft 3 makes the back and forth reciprocating motion so that the muscle stimulating member 2 stimulates the muscles.

[0007]

Here, in the conventional muscle stimulation massage device, both the motor and the eccentric rotor that rotates in accordance with the rotation of the motor and its supporting structure and power supply circuit devices are formed in the handle 1, it is difficult to use the body when the user grasps by hand and treats it.

[0008]

Further, in a technical structure in which the rotating force of the motor is used to reciprocate the slide member back and forth using an eccentric rotor, in order to balance the force of the motor acting on the slide shaft 3 vertically, The shaft 4 must be constituted.

In the present invention, in order to solve such a conventional problem, in constructing the muscle stimulation massage device, the rotational force of the motor serving as the vibration power providing means can act on the muscle stimulating member in the horizontal direction, So that a separate center of gravity axis is unnecessary. Further, the structure is simplified to make the handle part more slimmer, thereby providing a muscle stimulation massage device which can be easily grasped by a user.

The upper part of the main body is constituted by a motor for generating vibration and a motor for generating a vibration by converting the rotational force of the motor into a longitudinally reciprocating motion A motor control means for controlling the operation of the motor by supplying a driving voltage of the motor is built into the lower handle portion of the main body and its fixing means is constituted, And a swinging switch for providing a user operation command by a motor control means is formed at a position where the hand is held by the hand and the finger is located. And one side is coupled to the rotation axis of the motor in the horizontal direction and rotated to horizontally reciprocate the vibration slide part A vibrating slide part coupled to a crest of a spiral formed on the vibrating rotary part and reciprocating horizontally in the longitudinal direction by a width corresponding to the entire length of the crest as the vibrating rotary part rotates; A vibration stimulating portion which is exposed to the user's muscles to provide a vibration stimulation of the contact vibration slide portion and a departure prevention portion for preventing the left and right release of the vibration side portion in the horizontal reciprocating motion.

According to the present invention, by providing the rotational force of the motor for generating vibration in the horizontal direction, it is possible to transmit a simple and balanced force.

Also, since the structure for transmitting the rotational force of the motor and the motor to the axis of the vertical axis is not constituted in the handle portion as in the conventional art, the handle portion is made slim to allow the user to easily hold the handle, There is no need for a central axis and the design can be beautiful.

[0015]

1 is a perspective view showing a conventional muscle stimulation diastole.

[0001] The present invention relates to a muscle vibration massage device, and more particularly,

Fig. 3 is a view for showing a combined state of the respective means in the present invention. Fig.

FIG. 4 is a perspective view showing the appearance of the muscle vibration massage device of the present invention. FIG.

5 is a plan view and a side view showing the structure of an infrared lamp housing in the present invention, Fig. 6 is a plan view and a cross-sectional view taken along the line A-A 'in the plan view of the infrared LED lamp according to the present invention. Fig. 7 is a view showing various embodiments of the vibration stimulating portion in the present invention. 8 is a view showing only a vibration rotating part, a vibration slide part, and a departure preventing part in order to explain a horizontal moving operation of the oscillating rotary part and the oscillating slide part in the present invention.

[0016] The structure and operation of the muscle vibration massage device of the present invention will be described with reference to the embodiments shown in Figs. 2 to 8 attached hereto.

[0017] The upper portion of the main body 100 is provided with a motor 200 for generating vibration and a rotating force of the motor 200 in the forward and backward horizontal reciprocating motion And a motor control unit for controlling the operation of the motor by supplying a driving voltage of the motor to the lower knob unit 110 of the main body 100. [A key switch 400 for providing a user operation command by means of the motor control means is formed on the outer side of the handle 110 and the finger is held by the hand,

[0018] Wherein the vibration generating means comprises:

[0019] A spiral rib 311a is formed along the rotation direction from one side to the other side in the direction of rotation and one side is coupled to the rotation axis 210 of the motor 200 in the horizontal direction to rotate the vibration slide 320 A vibrating rotary part 310 for horizontally reciprocating motion and a vibrating rotary part 310 coupled to a spiral rib 311a formed in the vibrating rotary part 310 so that as the vibrating rotary part 310 rotates, A vibrating slide 320 which reciprocates and which is coupled to the front end of the vibrating slide 320 and is exposed to the outside of the main body 100 to provide a vibrating

stimulation of the contact vibrating slide 320 to the user's muscles, A magnetic pole portion 330 and a separation preventing portion 340 for preventing the left and right departure of the vibrating slide portion 320 when the vibrating slide portion 320 reciprocates horizontally.

[0020] An infrared LED lamp 500 for providing an infrared heat function and a circular shape corresponding to an inner surface shape of the main body 100. The main body 100 is coupled from the inside of the inlet of the main body 100, And further includes an infrared lamp housing 600 for fixing the infrared LED lamp 500 and guiding the infrared light generated from the infrared LED lamp 500 to irradiate the user's skin.

[0021] According to the present invention as described above,

[0022] The main body 100 is formed in a gun shape and has a vibration generating means for converting the rotational force of the motor 200 and the motor 100 into a vibration in the horizontal direction. Motor control means for rotating the motor 200 is constituted.

[0023] The vibration generating means includes a vibration rotating portion 310 coupled to a front end of a motor 200 for providing a rotating force, a vibration sliding portion 320 for generating vibration while sliding back and forth by a vibration rotating portion 310, A vibrating magnetic pole part 330 for transmitting a vibration stimulus generated by the vibrating slide part 320 to the user and a departure preventing part 340 for preventing the left and right departure of the vibrating slide part 320.

[0024] The vibration generating means is coupled to the rotating shaft 210 of the motor 200 and coupled to the vibration rotating portion 310 at the front end of the rotating shaft 210 of the motor 200 to rotate together with the rotating shaft 210 of the motor 200 .

[0025] The vibration rotation unit 310 includes a rotation axis coupling unit 311b coupled to the rotation axis 210 of the motor 200 and a cam 311 having a spiral ball 311a formed thereon, And a bearing fixing portion 313 for fixing the bearing 312. The bearing fixing portion 313 is formed of a resin material.

[0026] The rotation shaft coupling portion 311b is configured such that the rotation shaft coupling groove is formed so that the rotation shaft 210 of the motor 200 is inserted and coupled, and the rotation shaft 210 coupled to the rotation shaft coupling groove is coupled to the rotation shaft 210 .

[0027] The entire width of the spiral rib 311a formed on the cam 311 represents the horizontal reciprocating length of the oscillating slide portion 320. [

[0028] The vibrating slide part 320 is coupled to the valley 311a of the cam 311 so that the vibrating slide part 320 is reciprocated horizontally while moving along the valley 311a as the vibrating rotary part 310 is rotated .

[0029] The vibrating slide unit 320 includes a bearing 322 coupled to the valley 311a of the oscillating rotation unit 310, a linker 323 connecting the bearing 322 and the slide shaft 321, And a bush ring 324 coupled to the front and rear ends of the slide shaft 321.

[0030] The slide shaft 321 constitutes a linkage engaging portion 321a for engaging the linker 323 and an escape preventing groove 321b for engaging the right angle fixing pin 342 formed in the escape preventing portion 340. The release preventing groove 321b is formed to have a length longer than the distance that the slide shaft 321 moves in the forward and backward slide directions so that the coupled right and left fixing pins 342 do not catch when the slide shaft 321 slides forward and backward.

[0031] The vibrating magnetic pole part 330 is coupled to the tip of the slide shaft 321 of the vibration slide part 320 and is exposed to the outside through the entrance of the main body 100, It is a means of delivering a vibratory stimulus to the muscles.

[0032] The vibration stimulating portion 330 has a structure that can be replaced with the slide shaft 321. A shaft engaging groove 331 is formed to engage with the slide shaft 321. As shown in Figure 7, Accordingly, various types of vibration stimulating portions 330 can be constructed.

[0033] The vibration stimulating portion 330 is made of raw rubber latex or silicone rubber so as to protect the user's skin, and is harmless to the human body and does not cause discomfort.

[0034] The release preventing portion 340 is fixed to the motor 200 and supports the slide shaft 321 at an upper portion thereof. The release preventing portion 340 is a means for horizontally reciprocating motion, A cam passage hole 341b for coupling the cam 311 to the rotation shaft 210 of the motor 200 is formed at the center and a right angle fixing pin engagement portion The slide bracket 341 is coupled to the fixing bracket 341 and is coupled to the release preventing groove 321b formed in the slide shaft 321 so that the slide shaft 321 can be released (Not shown).

[0035] The main body 100 is provided with a motor 200 at an upper portion of a gun shape and constitutes a motor receiving portion 120 at a rear end of the motor 200.

[0036] The motor support unit 120 is a means for preventing the motor 200 from being pushed back when vibrations are generated by a force acting on the rear end due to an elastic force applied from the slide shaft 321 of the motor 200. [

[0037] A bracket fixing portion (not shown) for fixing the fixing bracket 341 for preventing horizontal movement and disconnection of the slide shaft 321 is formed at the front end of the rotary shaft 210 .

[0038] The slide shaft 321 is moved back and forth through the through hole 341a of the fixing bracket 341 and the cam 311 is coupled to the rotation shaft 211 of the motor 200 through the cam passage hole 341b. The right angle fixing pin 342 fixed to and supported by the fixing bracket 341 is inserted into the separation preventing groove 321b of the slide shaft 321 to prevent the slide shaft 321 from being left and right.

[0039] The entrance of the main body 100 is configured to be pierced so that the vibrating magnetic pole part 330 can be inserted and exposed from the inside.

[0040] A motor control means for controlling the motor 200 is provided in the handle 110 and a gun switch for providing a control signal to the motor control means at a position where the user's finger is placed on the handle 110 400).

[0041] The gun switch 400 is configured to allow an internal operation switch to be depressed when the user presses with his / her finger, and is provided with elastic means for providing an elastic force to the gun switch 400 to be returned to the original position when releasing the force And a switch structure of various types can be constructed.

[0042] Here, the gun switch 400 is formed of a switch that shoots a gun for the convenience of the user, and can be configured as a general type of switch.

[0043] The motor control means includes circuit means for the control means for supplying the power supplied from the power supply means and the power supply means to the motor 200 according to the switching of the gun switch 400 to drive the motor.

[0044] The power supply means may be of a charging type including a battery and a rechargeable battery, or may be a plug type using a power plug to connect a power plug to an outlet.

[0045] And further includes an infrared lamp housing 600 as shown in FIG.

[0046] The infrared lamp housing 600 fixes the infrared LED lamp 500 and guides the infrared light generated from the infrared LED lamp 500 to the user's skin.

[0047] The infrared lamp housing 600 is formed in a circular shape corresponding to the inner surface shape of the main body 100 and is configured to be coupled from the inside of the main body 100 so that the front surface portion is inserted into the inlet and exposed to the outside.

[0048] The infrared lamp housing 600 includes a plurality of infrared lamp fixing parts 610 to which the infrared LED lamp 500 is inserted and coupled along the outer circumference of the circular shape at a predetermined interval and a slide shaft 321, And a shaft passage hole 620 for passing the shaft through hole 620.

[0049] The infrared LED lamp 500 is a means for providing an infrared ray heating function by generating infrared ray light.

[0050] 6 is a view showing an example of an infrared LED lamp 500. The infrared LED lamp 500 is mounted on a circular panel 510 so as to be fitted to the infrared lamp fixing part 610 formed on the infrared lamp housing 600 500 may be arranged.

[0051] The infrared LED lamp 500 may be constituted as in the embodiment of the present invention which is controlled by the motor control means in accordance with the switching operation of the key switch 410 or may be constituted as a separate switch means. As shown in FIG.

[0052] The operation and operation of the muscle vibration massaging device of the present invention having the above-described structure will be described in detail as follows.

[0053] When the user pulls the gun switch 410, the switch of the motor control means configured in the handle 110 is touched and power is supplied to the motor 200 to rotate the motor 200.

[0054] When the motor 200 rotates, the cam 311 coupled to the rotation shaft 210 of the motor 200 rotates.

[0055] The spiral rib 311a is formed on the cam 311 of the oscillation rotary part 310. When the cam 311 rotates as described above, the bearing 311a, which is coupled to the valley 311a formed on the cam 311, The link 323 connected to the bearing 322 moves left and right while the slide shaft 321 moves along the valley 311a so that the position of the bearing 322 is shifted to the left and right width, And is horizontally moved.

[0056] As the position of the spiral rib 311a formed on the cam 311 is changed as the cam 311 rotates and the position of the bearing 322 coupled to the valley 311a is shifted to the left and right as the position of the spiral rib 311a formed on the cam 311 is changed, (321) is slid to the left and right, and vibration is generated while repeating the above process.

[0057] 8 is a view showing only a vibration rotating part, a vibration slide part, and a departure prevention part in order to explain a horizontal movement operation of the vibration rotating part and the vibration sliding part.

[0058] The vibration thus generated is transmitted to the muscles in the skin through the vibration stimulating portion 330 which is in contact with the user's skin.

[0059] In this case, the vibration stimulating portion 330 is configured to be replaceable with the slide shaft 321, and the vibrating stimulating portion 330 as shown in FIGS. 7 (a) to 7 (d) You can use it instead.

[0060] Also, the infrared light generated from the infrared LED lamp 500 is radiated to the front side along the infrared lamp housing 600 and irradiated to the user's skin to provide an infrared heat-up function.

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CLAIMS KR101123926

1.

The upper part of the main body 100 includes a motor 200 for generating vibration and a rotating force of the motor 200 in a longitudinally reciprocating motion And a motor control unit for controlling the operation of the motor by supplying a driving voltage of the motor to the lower knob unit 110 of the main body 100. [A key switch 410 for providing a user operation command to the motor control means is formed at a position where the hand is held and the finger is held by the hand, A spiral rib 311a is formed along the rotation direction from one side to the other side in the direction of rotation and one side is coupled to the rotation axis 210 of the motor 200 in the horizontal direction to rotate the vibration slide 320 Horizontal round trip And a vibrating rotary part 310 coupled to the spiral rib 311a formed in the vibrating rotary part 310 so that the vibrating rotary part 310 rotates along the entire length of the valley 311a in the front- And a vibrating magnetic pole part 320 coupled to a front end of the vibrating slide part 320 and exposed to the outside of the main body 100 to provide a vibrating stimulation of the contact vibration slide part 320 to the user's muscles, (330). & Lt; RTI ID = 0.0 & gt; 31. & lt; / RTI & gt;

2.

The muscle vibration massage device according to claim 1, further comprising a separation prevention part (340) for preventing the vibration slide part (320) from being leftwardly or rightwardly released when horizontally reciprocating.

3.

The apparatus according to claim 1, further comprising: an infrared lamp for operating according to the control of the motor control means in accordance with the switching of the dry-gun switch (400) to provide an infrared heat-up function; And an infrared lamp housing (not shown) for irradiating the user's skin with infrared light generated from the infrared lamp while fixing the infrared lamp, 600). & Lt; / RTI & gt;

4.

The infrared lamp lamp according to claim 3, wherein the infrared lamp comprises an infrared LED lamp (500), the infrared LED lamp (500) is configured such that an infrared LED is arranged on a circular panel, One or more infrared lamp fixing parts 610 are fixed at predetermined intervals and the shaft passing holes 620 are formed at the center for passing the slide shafts 321 through the infrared lamp fixing part 610 Wherein the massage device is a tubular type massage device.

5.

The motor according to claim 1, wherein the vibration rotary part (310) comprises a rotation axis coupling part (311b) coupled with a rotation axis (210) of the motor (200), a cam (311) And a bearing fixing part 313 for fixing the bearing 312. The bearing 312 is fixed to the other side of the rotary shaft engaging part 311b so that the bearing 311 can rotate stably, The unit 320 includes a bearing 322 coupled to the valley 311a of the oscillating rotation unit 310, a linker 323 connecting the bearing 322

and the slide shaft 321, And a bush ring (324) coupled to the front and rear ends of the slide shaft (321) and the slide shaft (321).

6.

The slide fastener according to claim 1 or 5, wherein the slide shaft (321) includes a linker engaging portion (321a) for engaging the linker (323), a right engaging pin (342) The separation preventing part 340 is fixed to the motor 200 and supports the slide shaft 321 to the upper part so as to enable horizontal reciprocating movement and to prevent the left and right departure A through hole 341a of the slide shaft 321 and a cam passage hole 341b for coupling the cam 311 to the rotation shaft 210 of the motor 200 are formed at the center of the through hole 341a of the slide shaft 321, A fixing bracket 341 formed with a right angle fixing pin engaging portion 341c for preventing the detachment of the slide shaft 321 and a fixing bracket 341 coupled to the detachment preventing recess 321b formed in the slide shaft 321, And a right angle fixing pin 342 for preventing the left and right detachable members 321 from horizontally reciprocating. Muscle vibration massage device being configured to.

7.

2. The muscle vibration massage device according to claim 1, wherein the vibration stimulating portion (330) has a structure that can be replaced with the vibration slide portion (320), and is made of raw rubber latex or silicone rubber.

8.

The motor according to claim 1, wherein the fixing means of the main body (100) comprises a motor receiving portion (120) for supporting a force acting from the slide shaft (321) to the rear end of the motor (200) And a bracket fixing part for fixing the fixing bracket 341 for fixing and disengaging the rotation shaft 210 and fixing the bearing 340 to the front end of the massage vibration massage device.

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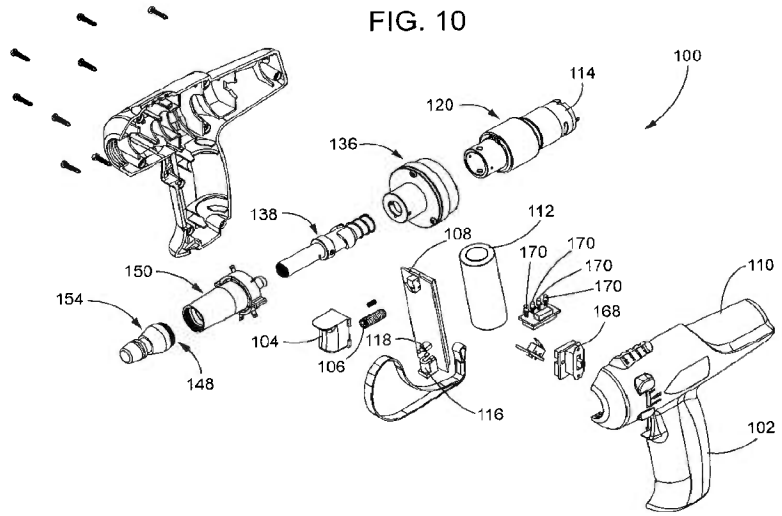
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(54) Title: PORTABLE CHIROPRACTIC ADJUSTOR

FIG. 10



(57) Abstract: A portable battery power operated chiropractic adjustor, manipulator or thruster for applying an adjustment energy to a patient through a plunger having a resilient or cushioned head with the energy applied to the plunger being supplied by non-manual sources and the impulse is adjustable or tunable along with having annunciators or indicators for preload and readiness to operate. The power source may be an internal rechargeable battery or removable rechargeable battery pack and the adjustor is DC motor operated to impart selectively single or multiple thrusts.

WO 2009/014727 A1

PORTABLE CHIROPRACTIC ADJUSTOR

FIELD OF INVENTION

[0001] The present invention relates generally to a portable chiropractic adjustor for use in chiropractic adjustment of musculoskeletal structures. More, particularly, this invention concerns an improved power operated chiropractic-adjusting device for use in spinal manipulative therapy to apply impact forces or thrusts to a human body.

BACKGROUND

[0002] The chiropractic art is generally concerned with adjusting misaligned body structures by manually manipulating the various joints in the human body. Of more specific interest in the art, however, is the spinal column which is comprised of several interconnected musculoskeletal structures or vertebrae. Unlike other, less critical body structures, the spinal column must be treated or manipulated with extreme caution because of its link with the central nervous system.

[0003] The human spine is susceptible to many different pathologic abnormalities including misalignment, miscellaneous trauma and pain, and degeneration as a result of age or disease. By employing various physical therapy techniques, though, a chiropractor, or one skilled in the chiropractic art, may be able to successfully treat a pathologic spine. Successful treatment will not only relieve any pain or discomfort that the patient might be suffering, but will also improve the overall quality of life of that patient.

[0004] One common spinal-adjustment technique involves applying thrusts or forces to the afflicted region of the spine. In particular, this technique involves either "mobilizing" the spine (i.e. passively moving the spine with relatively slow cyclic or oscillatory motion), or "manipulating" the spine (i.e. applying an impulsive thrust or force in a well-defined direction to a specific region of the spine). Depending on professional affiliations, this technique is referred to as chiropractic adjustment, osteopathic manipulation, orthopedic manual therapy, and/or spinal manipulative therapy.

[0005] There are several well-known procedures or techniques for "manipulating" or administering impulsive thrusts to a spine. One technique involves applying one or more rapid thumb thrusts to misaligned or afflicted vertebrae. Thumb thrusts, however, tend to be both imprecise in magnitude and location and tiresome to administer. Another technique

involves using a manually operated chiropractic-adjusting instrument. For instance, U.S. Pat. No. 4,116,235, issued to Fuhr et al. ("Fuhr"); Fuhr U.S. Pat. No. 6,702,836; Fuhr U.S. Pat. No. 6,379,375; Keller et al. U.S. Pat. No. 5,626,615; Keller et al. U.S. Pat. No. 5,656,017; and U.S. Pat. No. 4,498,464, issued to Morgan, Jr., disclose such instruments.

[0006] Throughout the years it has also been known that power driven devices at times can offer benefits or advantages in use over the manually operated devices. Particularly, there is a current need for a compact, lightweight device that is portable and yet can be easily and repetitively operated by a person with a lower degree of hand strength.

[0007] Electric solenoid operated adjustors such as ones described in Evans U.S. Pat. No. 4,841,955 issued in 1989 or Adelman U.S. Pat. No. 4,682,490, issued in 1987, can provide adjusting and controllability benefits over manual devices. However, using an electrical appliance operating at conventional voltages close to the body can be potentially hazardous and even prohibited by governmental regulatory agency rules or regulations and power supply cords can get in the way.

[0008] Thus, numerous efforts have been made to develop a power operated thrusters with all of the desired features and benefits required for safe and varied usage of such devices. Examples of such an approach in pneumatic operated thrusters is shown in U.S. Pat. No. 4,716,890, issued in 1988 to Bichel.

[0009] While the Bichel thruster as described did seek to overcome disadvantages presented in prior art devices, it still did not provide certain features and advantages required to achieve wide spread acceptance and use by chiropractic practitioners.

[0010] By way of example, it may be noted that such prior devices including Bichel are capable of only delivering a single thrust or stroke, provide only manual adjustability of stroke lengths; provide force adjustment by changing stroke length and change air pressure only at the compressor or supply source. In addition they involve complicated multiple parts designs which make them more costly to manufacture and more difficult and costly to maintain or use. A pneumatic thruster of Frye U.S. Pat. No. 6,503,211 has solved some of the problems and objections of the field.

SUMMARY OF THE INVENTION

[0011] The present invention may provide a portable chiropractic adjustor instrument comprising a DC motor driven plunger. The instrument may be relatively light weight and have a substantially long life rechargeable battery.

[0012] The present invention may provide an improved power operated chiropractic instrument that is "tunable" or settable as to load, amplitude, and frequency within a user selected range of natural frequency.

[0013] The present invention may provide a portable device with annunciators or indicators of settings such as preload and readiness to operate.

[0014] The present invention may provide a self contained power source for the adjusting instrument which is long lasting and yet can be rechargeable or replaceable.

[0015] These together with other features of the invention are more fully hereinafter described, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout.

[0016] It will be appreciated that the foregoing and subsequent descriptions are considered as illustrative only of aspects and features of the invention. Thus, it is not desired to limit the invention to the exact construction and operation shown and described, and, accordingly, all suitable modifications and equivalents may be utilized, falling within the scope of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] FIG. 1 is a top plan view of an embodiment of a portable chiropractic adjustor of the present invention;

[0018] FIG. 2 is a right elevational side view of the portable chiropractic adjuster shown in FIG. 1;

[0019] FIG. 3 is a left elevational side view of the portable chiropractic adjuster shown in FIG. 1;

[0020] FIG. 4 is a bottom view of the portable chiropractic adjuster shown in FIG. 1;

[0021] FIG. 5 is a front elevational view of the portable chiropractic adjuster shown in FIG. 1;

[0022] FIG. 6 is a rear elevational view of the portable chiropractic adjuster shown in FIG. 1;

[0023] FIG. 7 is a partial cross-sectional view taken through line 7-7 of the portable chiropractic adjuster shown in FIG. 1;

[0024] FIG. 8 is another cross-sectional view taken through line 7-7 of the portable chiropractic adjuster shown in FIG. 1;

[0025] FIG. 9 is a cross-sectional view taken through line 9-9 of FIG. 2 of the portable chiropractic adjuster shown in FIG. 1;

[0026] FIG. 10 is an exploded view of the portable chiropractic adjuster shown in FIG. 1;

[0027] FIG. 11 is an exploded view of a motor and gear mechanism for the portable chiropractic adjuster shown in FIG. 1;

[0028] FIG. 12 is an exploded view of a heat dissipating mechanism for the portable chiropractic adjuster shown in FIG. 1;

[0029] FIG. 13 is an exploded view of a thrust transfer mechanism for the portable chiropractic adjuster shown in FIG. 1;

[0030] FIG. 14 is an exploded view of a barrel portion for the portable chiropractic adjuster shown in FIG. 1;

[0031] FIG. 15 is an exploded view of a plunger mechanism for the portable chiropractic adjuster shown in FIG. 1; and

[0032] FIG. 16 is a simplified diagram illustrating a control board in communication with components of the portable chiropractic adjuster shown in FIG. 1.

DETAILED DESCRIPTION OF THE INVENTION

[0033] Turning to FIGS. 1-16, there is shown another embodiment of a portable chiropractic adjustor instrument 100. Referring to FIGS. 1-6, the portable chiropractic instrument 100 may comprise a structure, including a housing, that is relatively convenient for an operator to hold, adjust, and operate. The instrument may have an ergonomic handle 102 which is comfortable and convenient to grip. The portable chiropractic instrument 100 may also have a trigger mechanism 104 that likewise comfortably receives an operators finger for firing the instrument. As shown in FIG. 8, the trigger 104 may be coupled to a spring 106 which biases the trigger 104 in the non-engaged position. The trigger 104 may be in contact with a switch 108 that is depressed when the trigger 104 is depressed to operate the instrument 100.

[0034] Turning to FIGS. 7-15, suitable internal components of the portable chiropractic instrument 100 are shown in detail. The instrument 100 may utilize a battery 112 such that the such that the portability of the instrument 100 is enhanced by not requiring an unwieldy power cord for usage. Furthermore, in order to offer further enhanced portability along with a reasonable battery usage life, the instrument may utilize a DC motor 114 which is significantly more energy efficient than solenoid driven devices. In addition, a DC motor 114 may generally be constructed such that it weighs less than a solenoid for supplying a comparable amount of force such that the instrument 100 may be made lighter, and thus, easier for an operator to hold over an extended period of time than a solenoid driven instrument. The battery 112 may be disposed in the handle 102 and the motor 114 may be disposed in the housing 110 such that it is in line with a plunger mechanism 154 (described in further detail below).

[0035] In some embodiments, the battery 112 may be generally disposed within the housing 110 such that it is not generally removable by the operator. In other embodiments, the battery 112 may be removable and replaceable by the operator. The battery 112 may be any suitable battery for driving a DC motor 114 with long usage and recharge characteristics. The battery 112 may be rechargeable such that the battery 112 may be reused after charging.

[0036] The instrument 100 may comprise a charging port 116, such as shown in FIGS. 7 and 8, for receiving an adaptor to recharge the battery 112. In some embodiments where the battery112 is removable, the battery 112 may be removed for charging in a free standing charger and may be replaced with a spare charged battery when one battery 112 is being charged. The instrument 100 may also comprise a charge indicator 118, such as an LED light shown in FIGS. 7, 8, and 10, that may inform an operator when the battery 112 is charging, when the battery 112 has been charged, and/or when the battery 112 is nearly discharged. It will be appreciated that any suitable form of battery 112 indicator may be used, the instrument 100 may utilize any suitable number of battery indicators, and the battery indicator(s) may be used to indicate any suitable battery condition. In some embodiments, the battery 112 may be a lithium-ion rechargeable battery.

[0037] Referring to FIGS. 7-11, the motor 114 may be in contact with a gear mechanism 120 that may comprise a plurality of gears 122 for assisting with the transfer of force from the motor 114 to further components of the instrument 100. In some embodiments, the gear mechanism 120 may comprise a gear housing 124 having gear teeth 126 on an internal surface of the gear housing 124. The gear mechanism 120 may comprise one or more sets of

planetary gears 128. A pinion gear plate 130 may be disposed between sets of planetary gears 128 to transfer motion. The gear mechanism 120 may also comprise a head portion 132 having one or more camming actuators, such as protrusions 134.

[0038] Referring to FIGS. 7-10 and 12, the instrument may comprise a heat dissipation structure 136 for dissipating heat within the instrument 100. In some embodiments, the heat dissipation structure 136 may operate as a heat sink to draw heat away from one or more components within the instrument 100. The heat dissipation structure 136 may at least partially surround a portion of the thrust transfer mechanism 138 (described below).

[0039] Turning to FIGS. 7-10 and 13, the instrument 100 may comprise a thrust transfer mechanism 138. The thrust transfer mechanism 138 may comprise a suitable structure(s) for contacting the gear mechanism and converting the rotational forces conveyed by the motor 114 to the gear mechanism 120 into an axial force directed away from the motor 114 and toward a patient. For example, the thrust transfer mechanism 138 may operate as a camming structure and may comprise one or more ramping structures 140, with grooves 142 therebetween, coupled to a ramping component 144. The protrusions 134 of the head portion 132 of the gear mechanism 120 may ride along these ramping structures 140. The ramping component 144 may be biased away from the motor by one or more springs 146.

[0040] As the head portion 132 of the gear mechanism 120 is rotated, the protrusions 134 ride up the ramping structures 140 which forces the ramping component 144 to move toward the motor 114 and compress the one or more springs 146. As the ends of the ramping structures 140 are reached, the protrusions 134 reach the grooves 142 and the spring force propels the ramping component 144 forward. In this way, the rotational forces of the motor 114 have been converted into an axial force.

[0041] Referring to FIGS. 1-5, 7-10, and 14, the instrument 100 may comprise a forward end 148 having a barrel portion 150 coupled to the housing 110. The barrel portion 150 may comprise a plurality of components for receiving a force from the thrust transfer mechanism 138 and conveying the force to a plunger mechanism 154 (described below). For example, the barrel portion 150 may comprise a hammer 152 for receiving and carrying forward the force created by the spring force propelling the ramping component 144 forward when the trigger 104 has been engaged.

[0042] Referring to FIGS. 1-5 and 7-10, and 15, the forward end 148 may further have a plunger mechanism 154. The plunger mechanism 154 may have a suitable structure for asserting a force on a patient. Furthermore, the plunger mechanism 154 may have a suitable

structure for allowing an operator to assert a preload force on a patient before firing the instrument 100.

[0043] The plunger mechanism 154 may comprise a plunger 156, a plunger housing 158, a spring 160, a force transfer pin 162, and an o-ring 164. When assembled, the spring 160 may be disposed around the force transfer pin162 and both the spring 160 and the force transfer pin 162 may be at least partially disposed within the plunger housing 158. The plunger housing 158 may be coupled to the barrel portion 150. A tip 166 may be disposed at an end of the plunger 156 for contact with the patient. The tip 166 may be cushioned. The plunger 156 may be mounted such that the plunger 156 may be at least partially received by the plunger housing 158. The plunger 156 can be interchangeable with various single or dual style forms.

[0044] The plunger 156 may be movable with respect to the plunger housing 158 when a force is asserted against the tip 166. The plunger 156 may be coupled to a suitable structure, such as the spring 160 disposed against the force transfer pin 162, which applies an increasing amount of force to resist the inward movement of the plunger 156 as the plunger 156 is pushed further into the plunger housing 158. This permits an operator of the instrument 100 to apply a preload force prior to engaging the trigger 104. Therefore, the plunger mechanism 154 may have a structure such that as the instrument 100 is pressed against the patient and as the plunger 156 moves further into the plunger housing 158, the amount of preload force increases.

[0045] In addition, the force transfer pin 162 receives the force transmitted through the barrel portion 150 when the trigger 104 is engaged and directs the force onto the patient via the plunger 156 and plunger tip 166. This force is carried by the hammer 152 through the barrel portion 150 to the force transfer pin 162. The o-ring 164 provides a cushioning contact between the force transfer pin 162 and the hammer 152 to reduce the noise that would otherwise result from the impact of these two components and also reduce the wear on these components. The amount of preload force that is applied to the force transfer pin 162 may affect the distance that the force transfer pin 162 travels when the trigger 104 is engaged.

[0046] Referring to FIGS. 2 and 10, the instrument 100 may comprise a suitable mechanism for turning the instrument 100 on and off and setting the instrument 100 to any suitable operating mode. For example, the instrument 100 may comprise a switch 168 that is movable between any two or more suitable positions to place the instrument 100 into a desired operating mode.

[0047] In one embodiment, the switch 168 may be movable between an off mode, a single thrust operating mode, and a multiple thrust operating mode. In the single thrust operating mode, the instrument 100 may apply a single thrust for each activation of the trigger 104. In comparison, the multiple thrust setting may apply multiple thrusts for each activation of the trigger 104. In some embodiments, the instrument 100 may continue to apply thrusts until such time as the trigger 104 is released. In other embodiments, the instrument 100 may apply a predetermined or operator set number of thrusts. It will be appreciated, however, that the switch 168 may be used to place the instrument 100 into any suitable operating mode and the switch 168 may be movable between any suitable number of operating modes.

[0048] An annunciation structure may be disposed on the instrument to provide feedback to the operator as to such things as preload settings, loading status, readiness, force settings, and even values of impulse frequency or amplitude. It will be appreciated that the annunciation structure may be any suitable structure in any suitable quantity. As shown in FIGS. 1, 7, and 8, the housing may comprise a plurality of indicators 170, such as LED lights, that indicate the thrust setting. The instrument 100 may have any suitable number of indicators 170 representing any suitable number of thrust settings. In some embodiments, the LED lights could change colors, such as from red to yellow to green, for example, for preload status. In some embodiments, the annunciation structure may be an LCD display and/or an audio annunciator. An LCD display could be graphic, alpha numeric, and/or pictorial.

[0049] By way of example and not limitation, as shown in FIGS. 1, 7, and 8, the instrument may have indicators 170 that notify the operator when certain predetermined amounts of preload force have been asserted on the patient based on information provide by the one or more preload force sensors disposed within the housing 110. As the amount of preload force applied reaches a first predetermined amount, the first indicator will notify the operator. As the amount of preload force is increased to a second predetermined amount, the second indicator will notify the operator. Further indicators may be provided to indicate when further increased amounts of preload force have been reached. In this way, the operator may accurately apply a desired amount of preload force before engaging the trigger 104. In one example embodiment, the respective indicators 170 may notify an operator when 19 pounds, 34 pounds, 38 pounds, and/or 55 pounds of preload force have been applied. In another example embodiment, respective indicators 170 may notify an operator when 75 Newtons, 125 Newtons, 175 Newtons, and/or 250 Newtons of preload force have been

applied. It will be appreciated that any suitable number of indicators 170 may indicate any suitable levels of preload force.

[0050] The motor 114 may be in contact with a gear mechanism 120 for driving the thrust of the tip 166 in response the engagement of the trigger 104. When the trigger switch 108 is depressed, power from the battery 112 may be provided to the motor 114. Depending on whether the instrument 100 is set for single thrust operation or multiple thrust operation, the motor 114 may be driven for only a relatively short period of time, the motor 114 may be driven for a desired longer period of time to provide a predetermined number of thrusts, or the motor 114 may be driven until the trigger 104 is released. The motor 114 may drive the gear mechanism 120, which in turn, may apply a force on the thrust transfer mechanism 138. The thrust transfer mechanism 138 may convert the rotational force of the gear mechanism 120 into an axial force that may be transmitted through the instrument to the plunger 156 and on the patient.

[0051] As shown in FIG. 16, a control board may be disposed within the instrument that may be used to communicate with such features as the battery 112, motor 114, annunciaton structure(s) (such as 170), thrust setting switch(es) 168, microsensors 176, preload sensor(s) 174, and any other suitable structures, for operation of the portable chiropractic instrument 100. The circuitry of the instrument 100 may also contain microprocessor devices for data storage such as number and duration of thrusts, for example, and the data collected can be downloadable to a computer having diagnostic software and/or a patient database.

[0052] All references, including publications, patent applications, and patents, cited herein are hereby incorporated by reference to the same extent as if each reference were individually and specifically indicated to be incorporated by reference and were set forth in its entirety herein.

[0053] The use of the terms "a" and "an" and "the" and similar referents in the context of describing the invention (especially in the context of the following claims) are to be construed to cover both the singular and the plural, unless otherwise indicated herein or clearly contradicted by context. The terms "comprising," "having," "including," and "containing" are to be construed as open-ended terms (i.e., meaning "including, but not limited to,") unless otherwise noted. Recitation of ranges of values herein are merely intended to serve as a shorthand method of referring individually to each separate value falling within the range, unless otherwise indicated herein, and each separate value is incorporated into the specification as if it were individually recited herein. All methods

described herein can be performed in any suitable order unless otherwise indicated herein or otherwise clearly contradicted by context. The use of any and all examples, or exemplary language (e.g., "such as") provided herein, is intended merely to better illuminate the invention and does not pose a limitation on the scope of the invention unless otherwise claimed. No language in the specification should be construed as indicating any non-claimed element as essential to the practice of the invention.

[0054] Preferred embodiments of this invention are described herein, including the best mode known to the inventors for carrying out the invention. Variations of those preferred embodiments may become apparent to those of ordinary skill in the art upon reading the foregoing description. The inventors expect skilled artisans to employ such variations as appropriate, and the inventors intend for the invention to be practiced otherwise than as specifically described herein. Accordingly, this invention includes all modifications and equivalents of the subject matter recited in the claims appended hereto as permitted by applicable law. Moreover, any combination of the above-described elements in all possible variations thereof is encompassed by the invention unless otherwise indicated herein or otherwise clearly contradicted by context.

What is claimed is:

1. A portable chiropractic adjustor for applying an adjustment energy to a patient, the portable chiropractic adjustor comprising:

a plunger mechanism having a plunger and a plunger tip;

a housing having a thrust transfer structure for transferring an axial thrust force through the housing to the plunger mechanism, a camming structure, and a handle having a trigger;

a DC motor disposed within the housing for rotatably driving the camming structure in response to the trigger being engaged; and

a cam actuator for converting the rotational drive of the camming structure to the axial thrust force applied to the thrust transfer structure.

2. The portable chiropractic adjustor of claim 1 wherein the DC motor is battery operated.

3. The portable chiropractic adjustor of claim 2 wherein the battery is rechargeable.

4. The portable chiropractic adjustor of claim 1 wherein the plunger mechanism has a spring in contact with the plunger for an application of a preload force.

5. The portable chiropractic adjustor of claim 1 further comprising an annunciator.

6. The portable chiropractic adjustor of claim 5 wherein the annunciator indicates an amount of preload force applied.

7. The portable chiropractic adjustor of claim 1 further comprising a switch for changing the portable chiropractic adjustor between a single thrust operation mode and a multiple thrust operation mode.

8. The portable chiropractic adjustor of claim 1 wherein the camming structure comprises a ramp for contacting the cam actuator.

9. The portable chiropractic adjustor of claim 8 wherein the camming structure comprises a groove for receiving the cam actuator.

10. The portable chiropractic adjustor of claim 1 wherein the camming structure is in contact with a spring.

FIG. 1

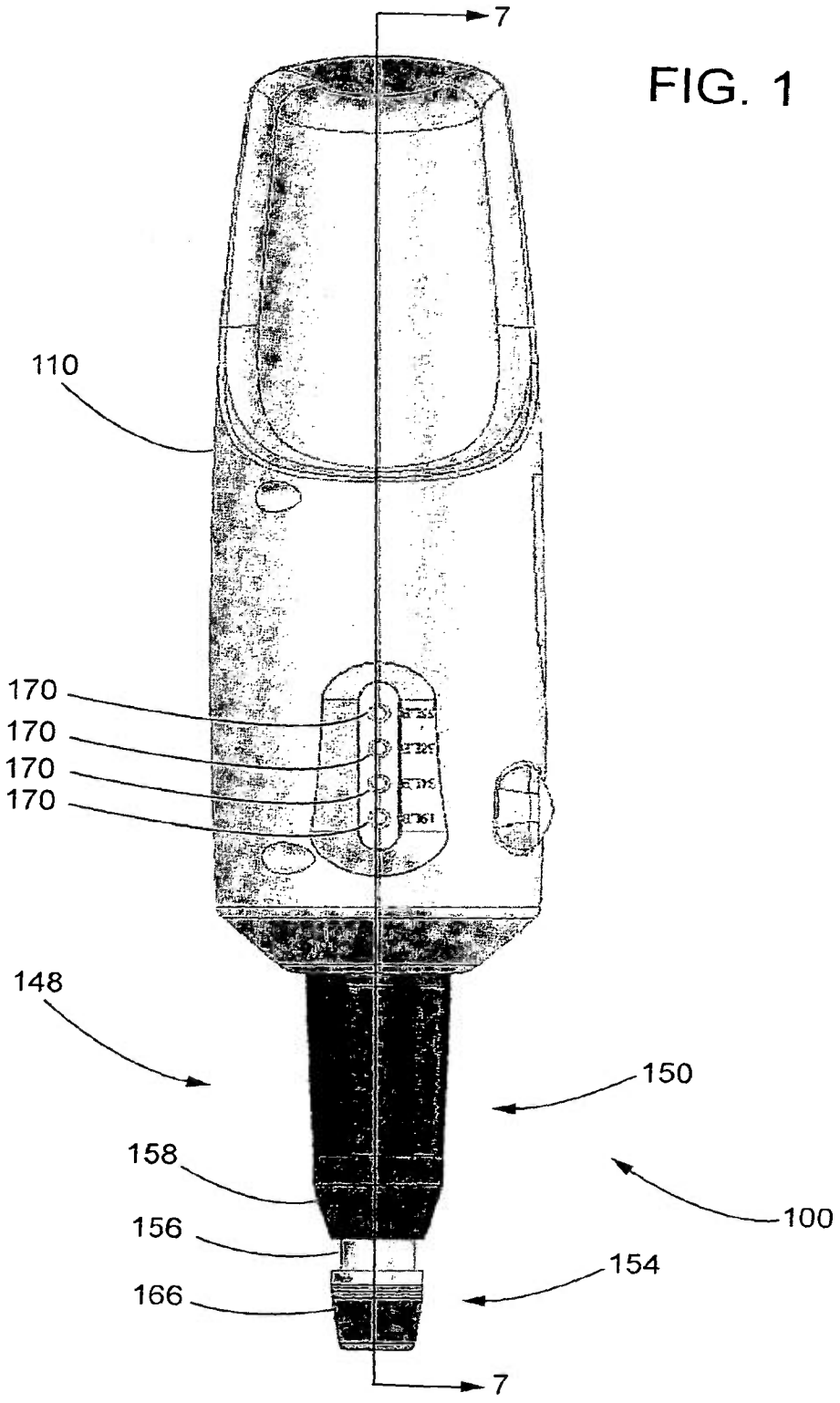
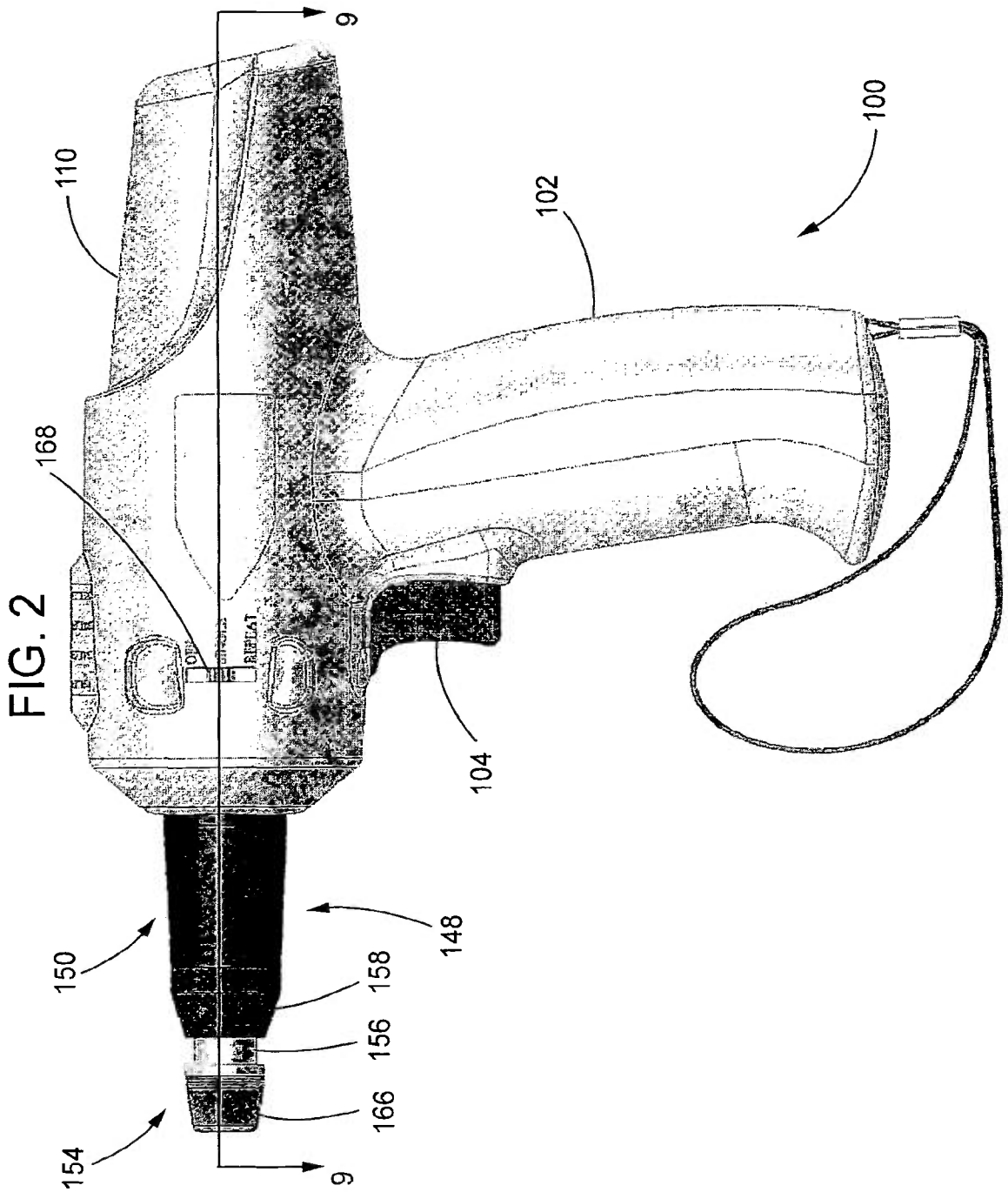


FIG. 2



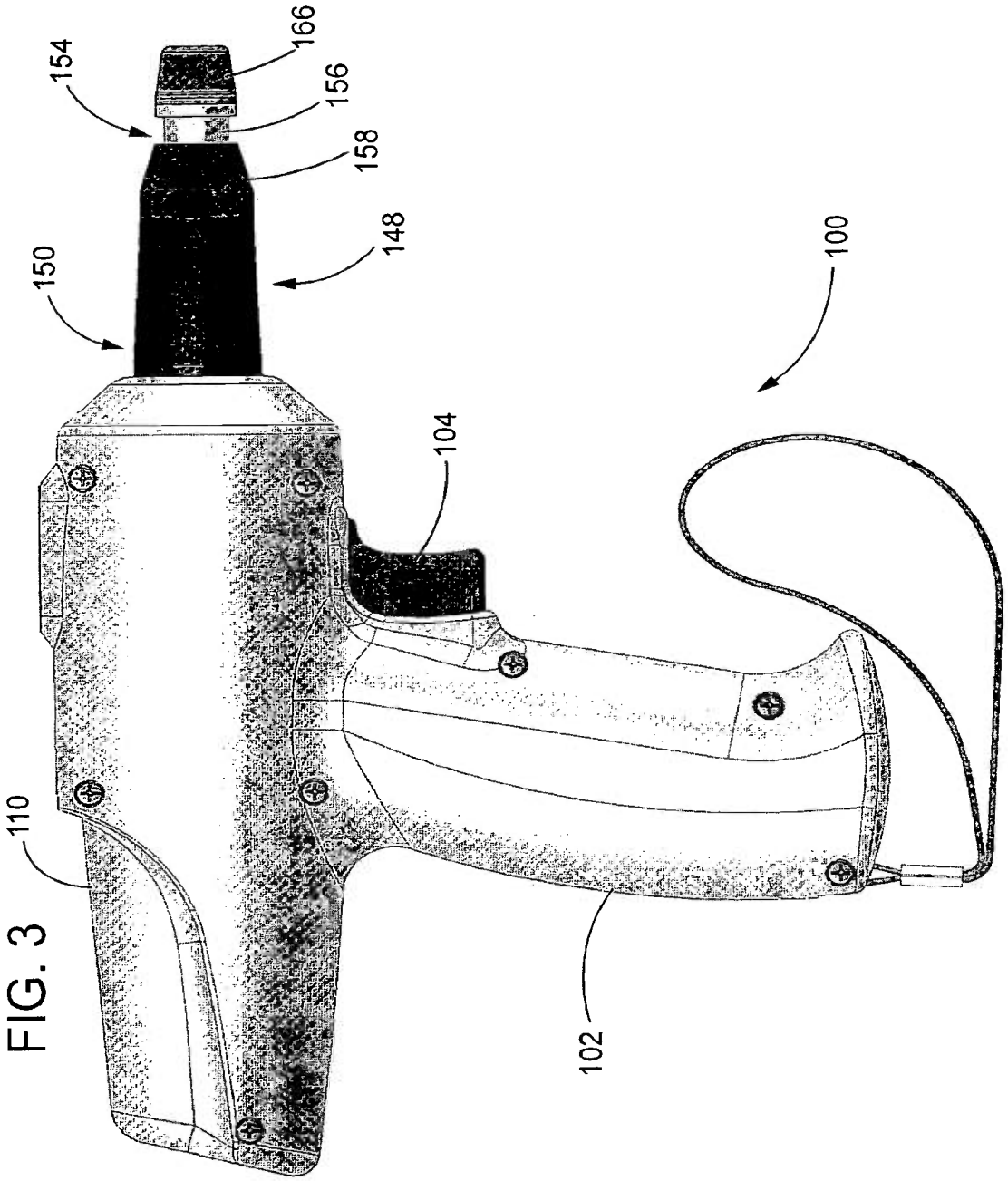


FIG. 3

FIG. 4

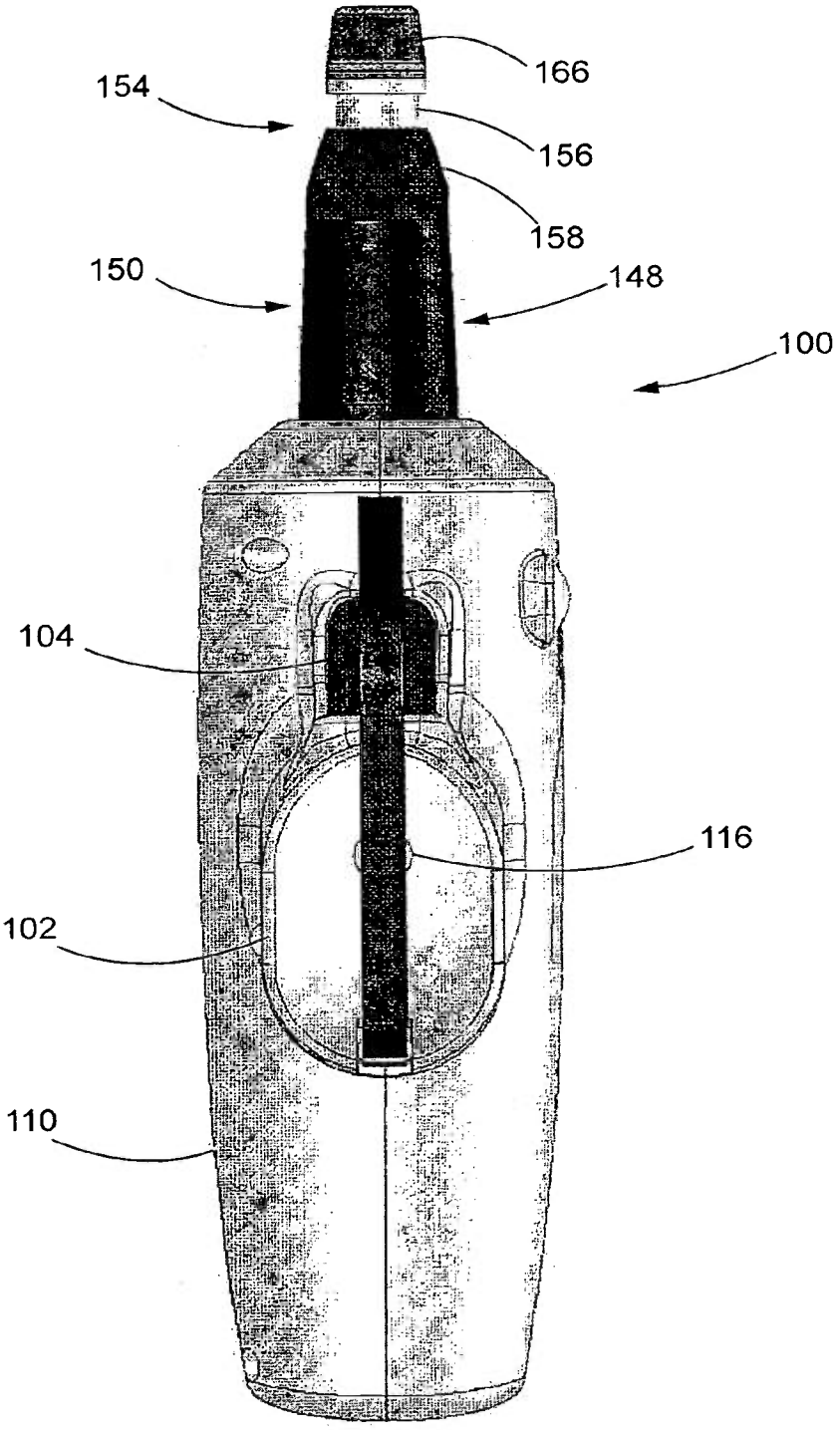


FIG. 5

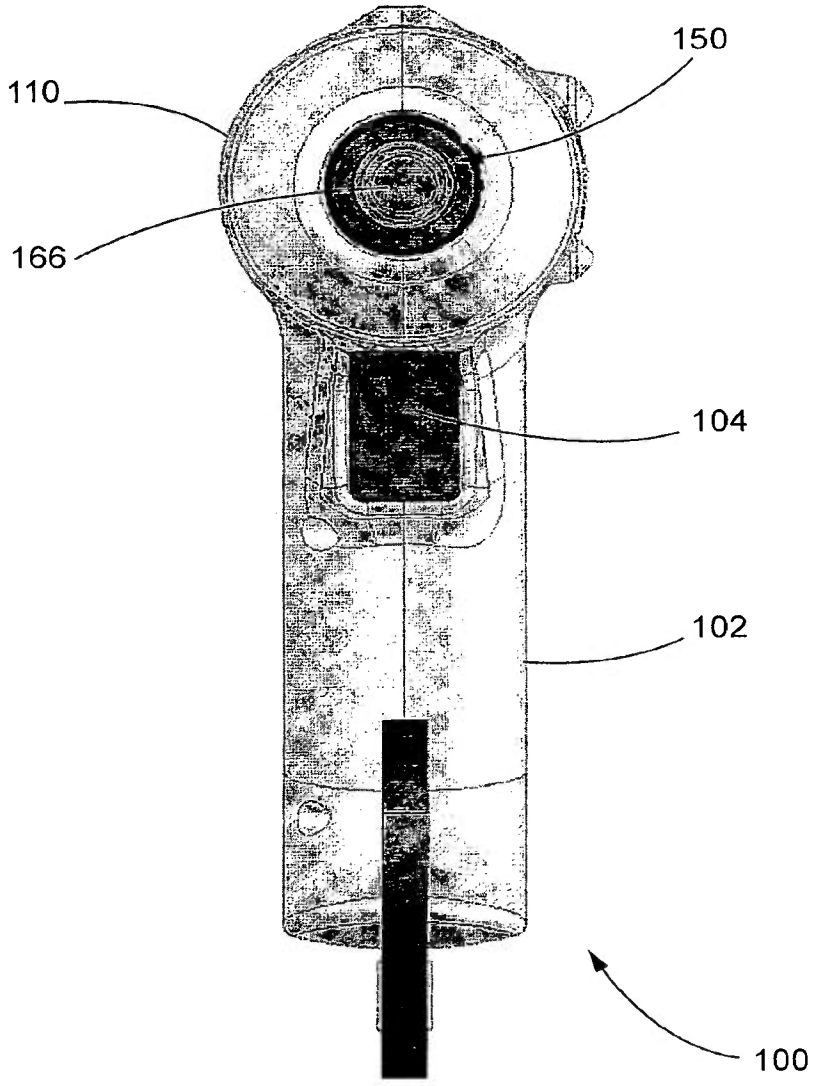
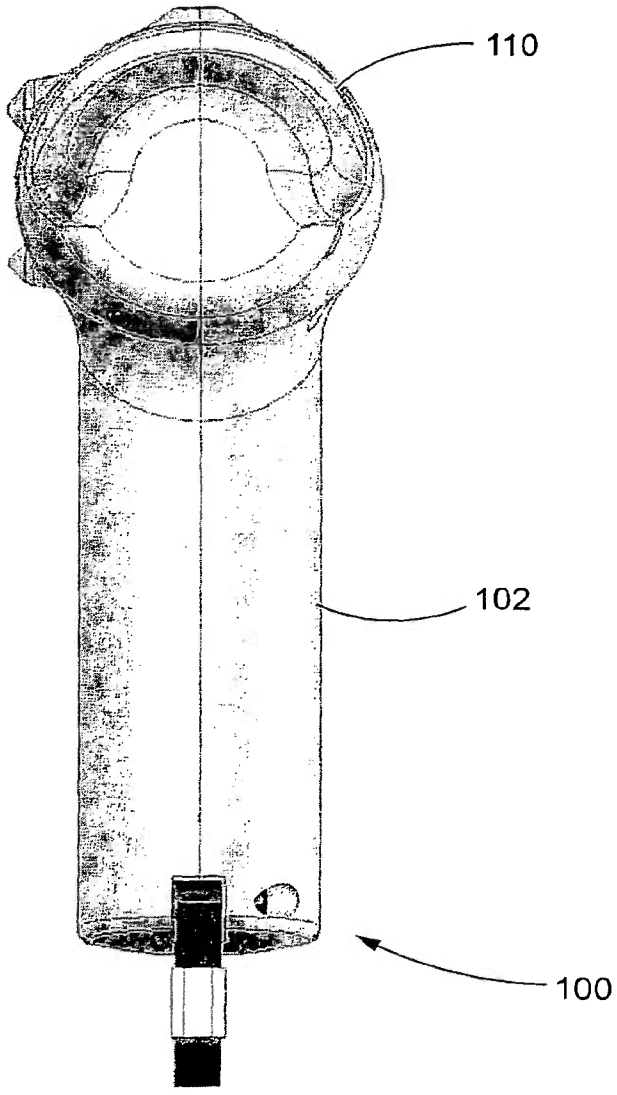


FIG. 6



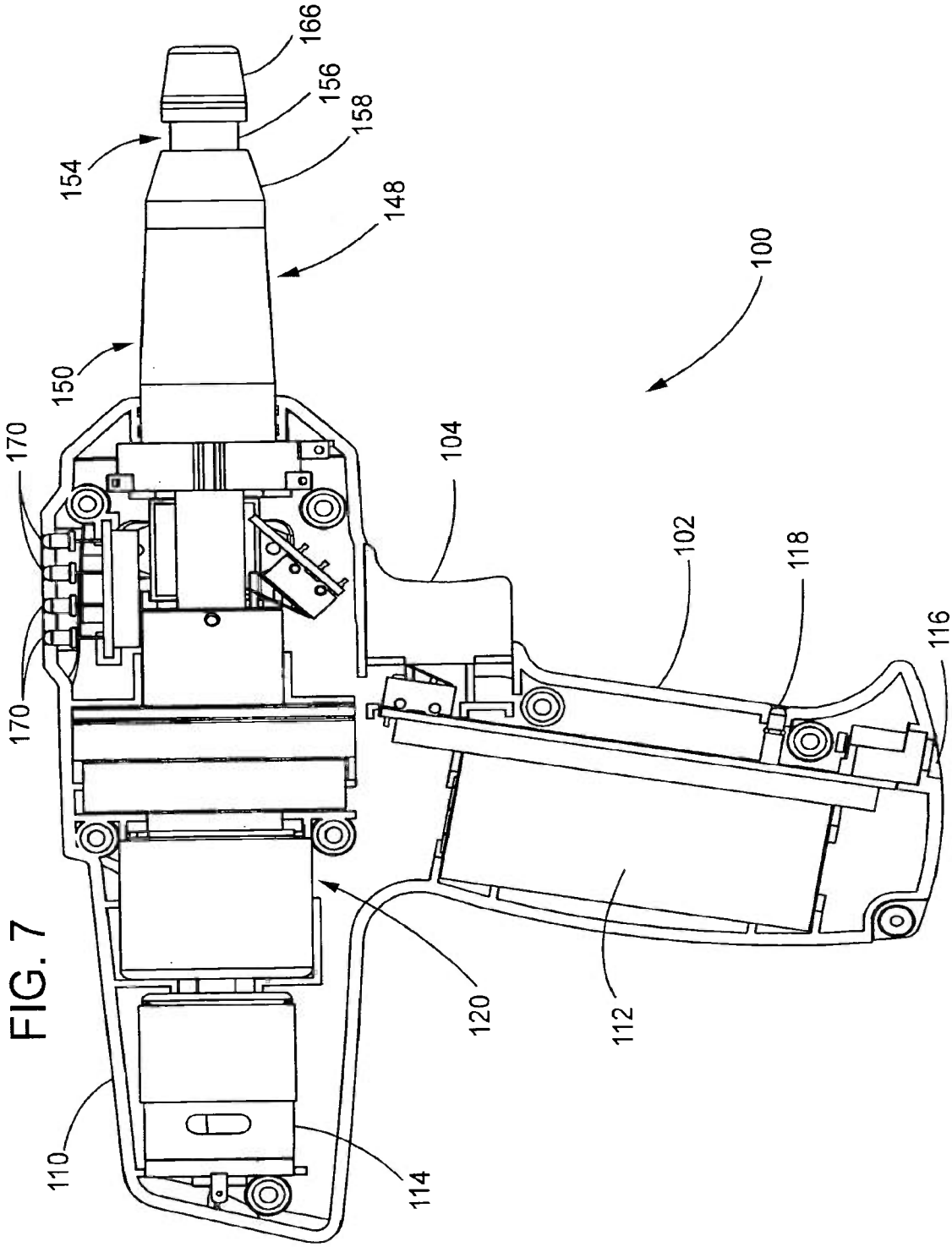

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FIG. 7

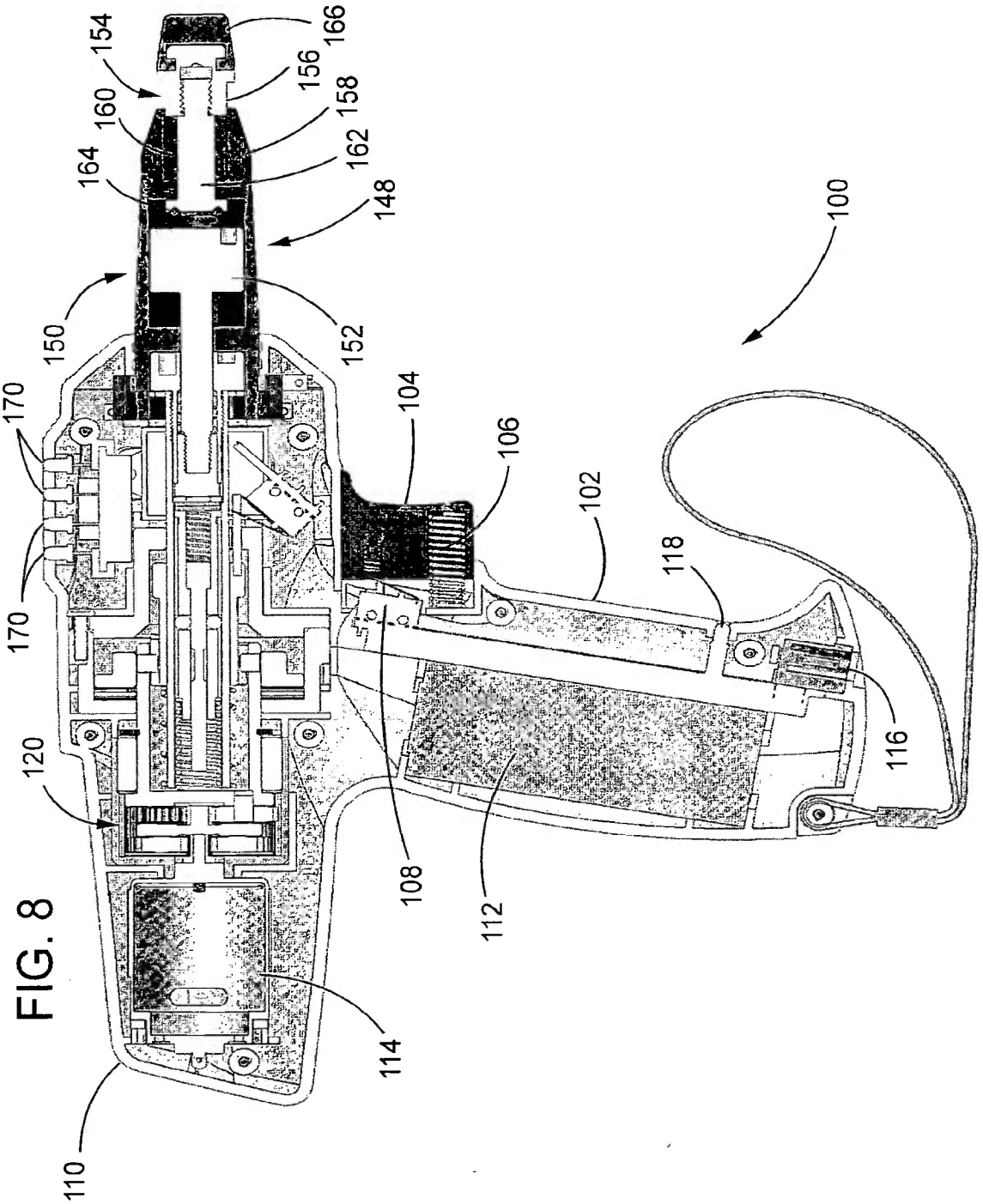

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FIG. 8

FIG. 9

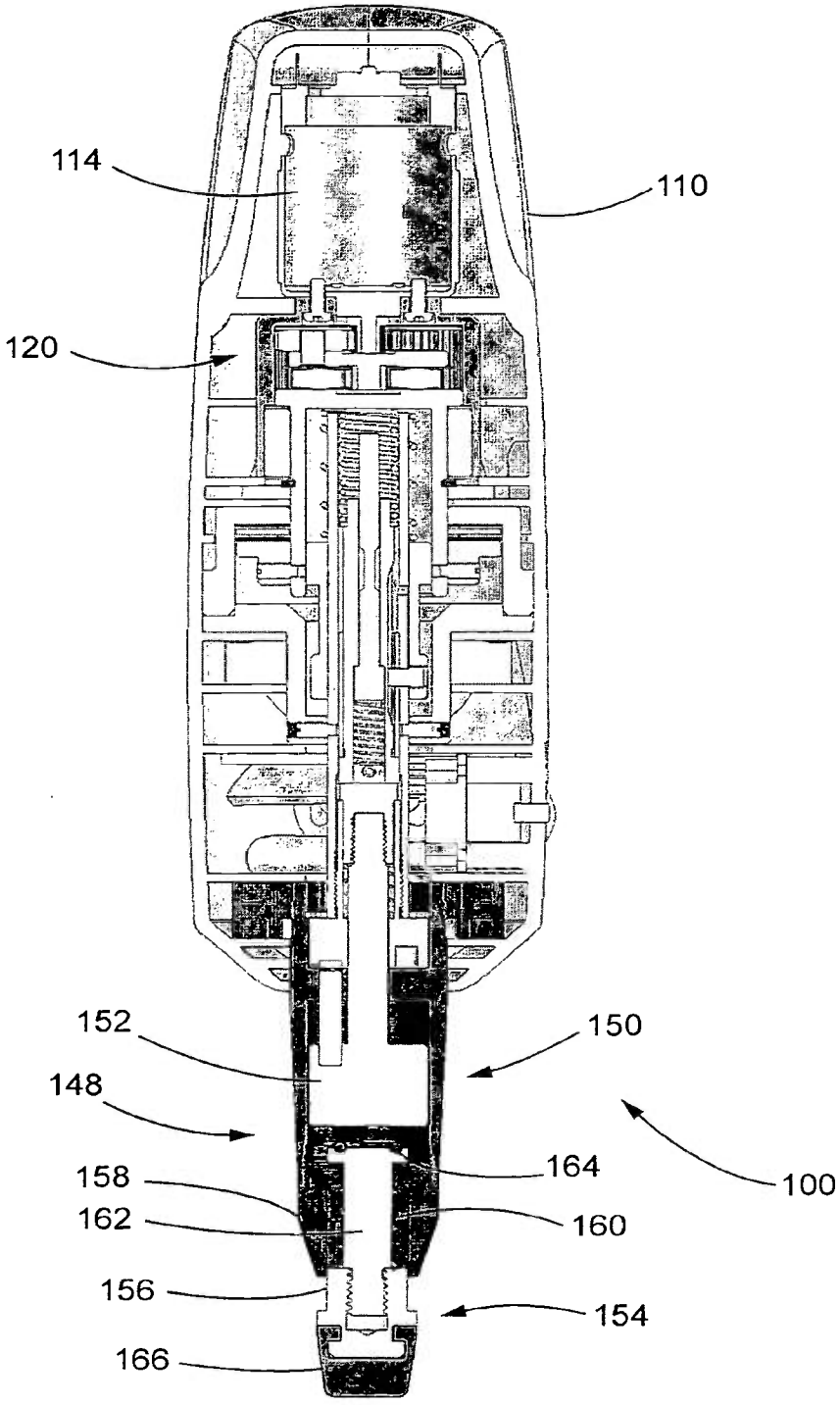


FIG. 10

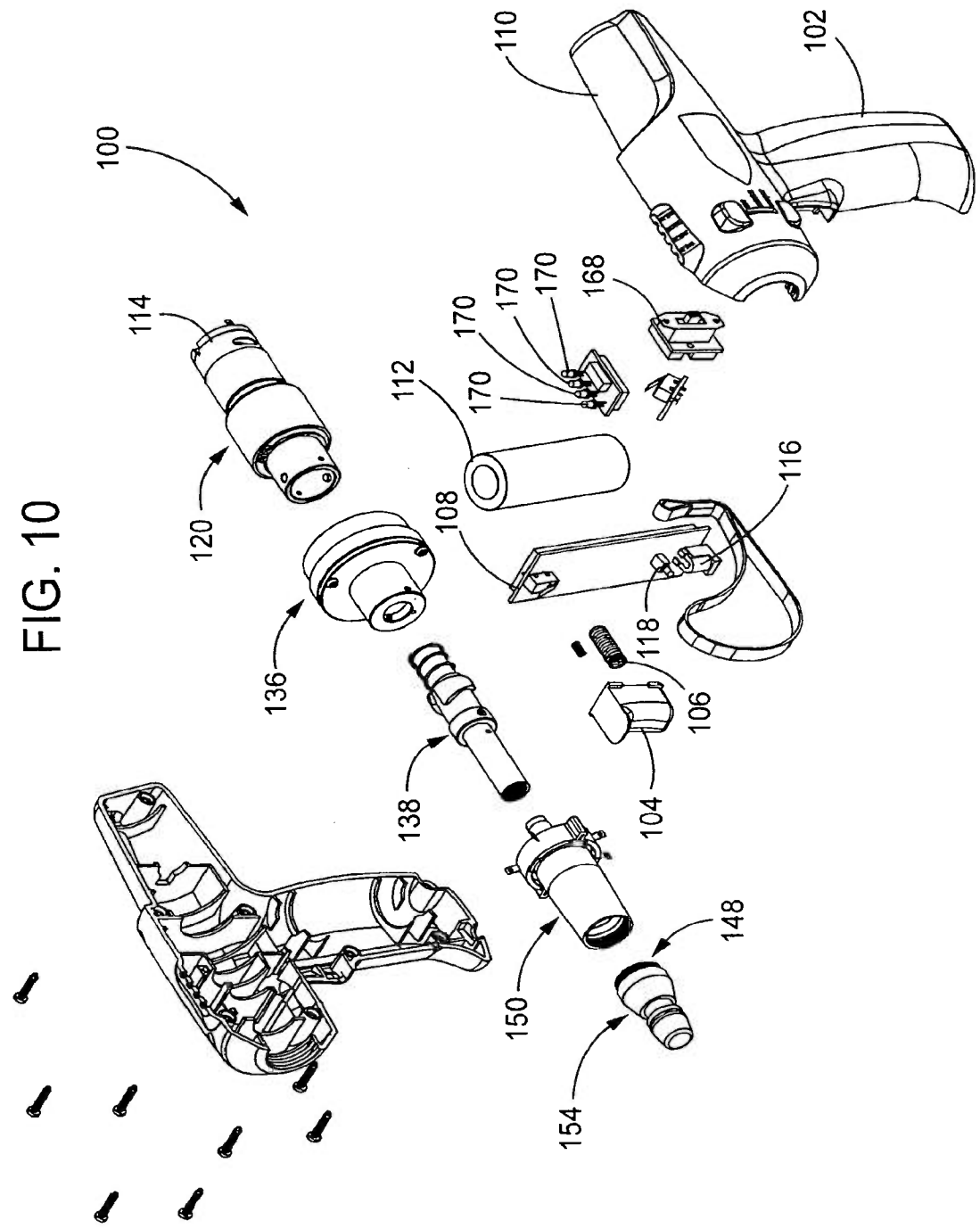
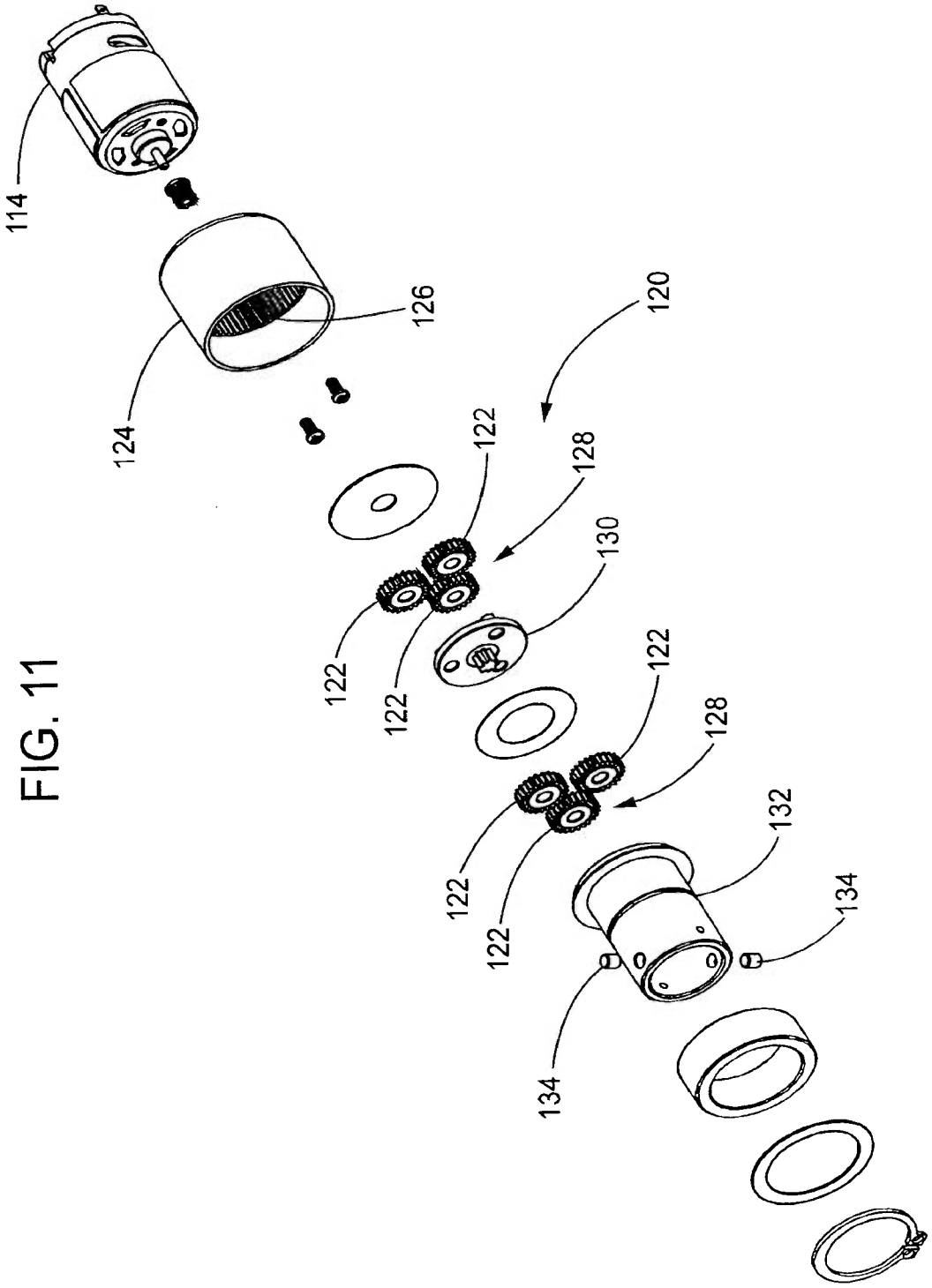

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FIG. 11



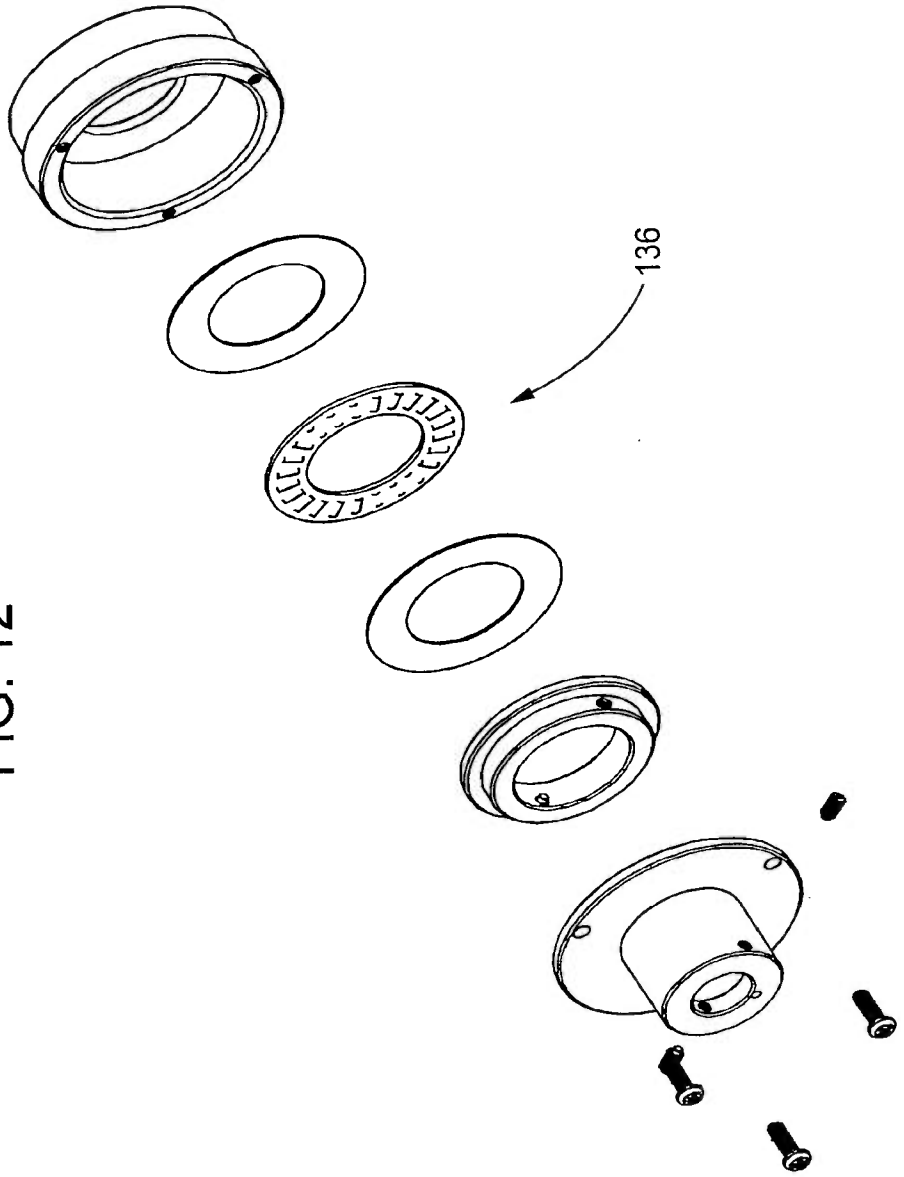


FIG. 12

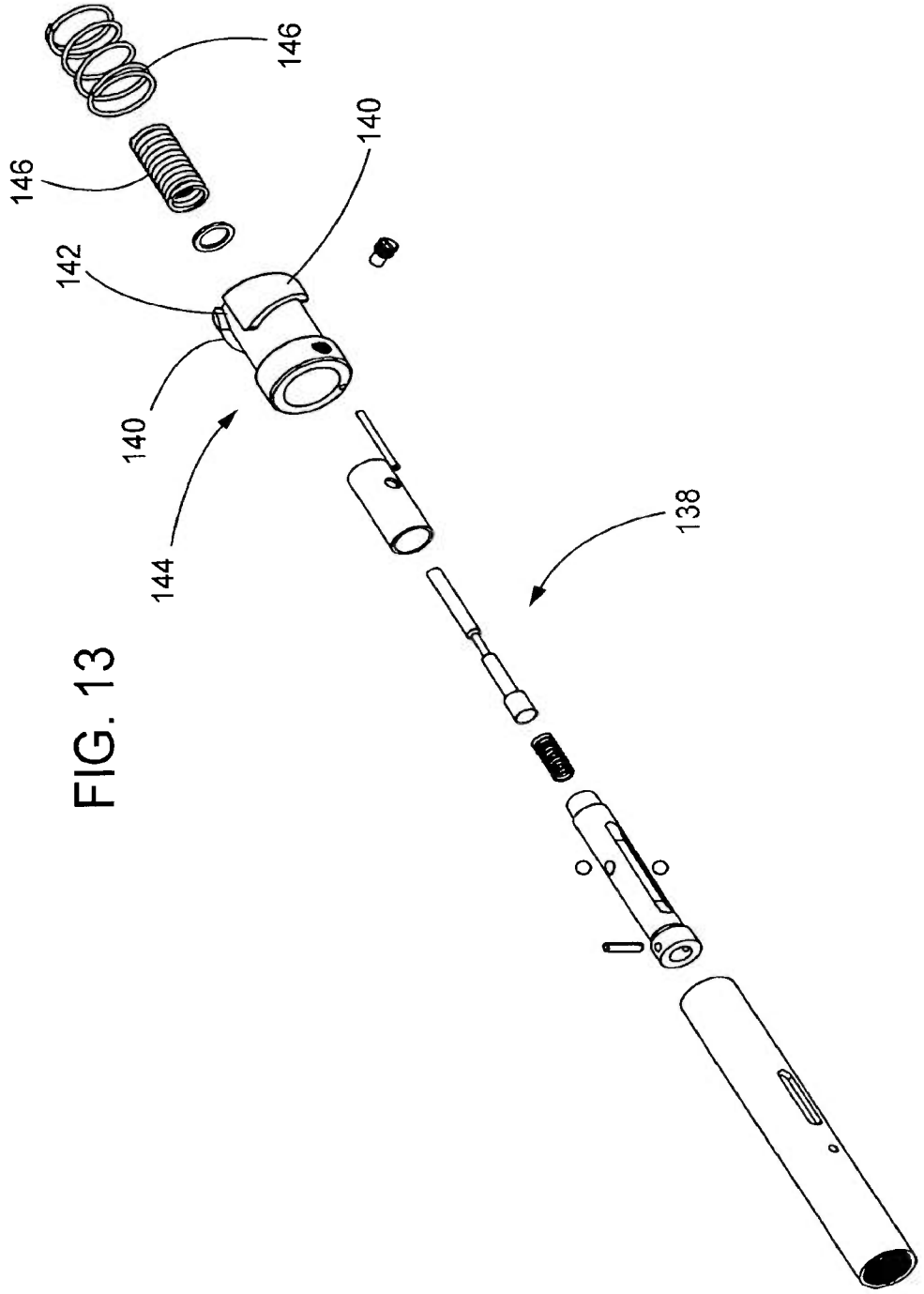


FIG. 13

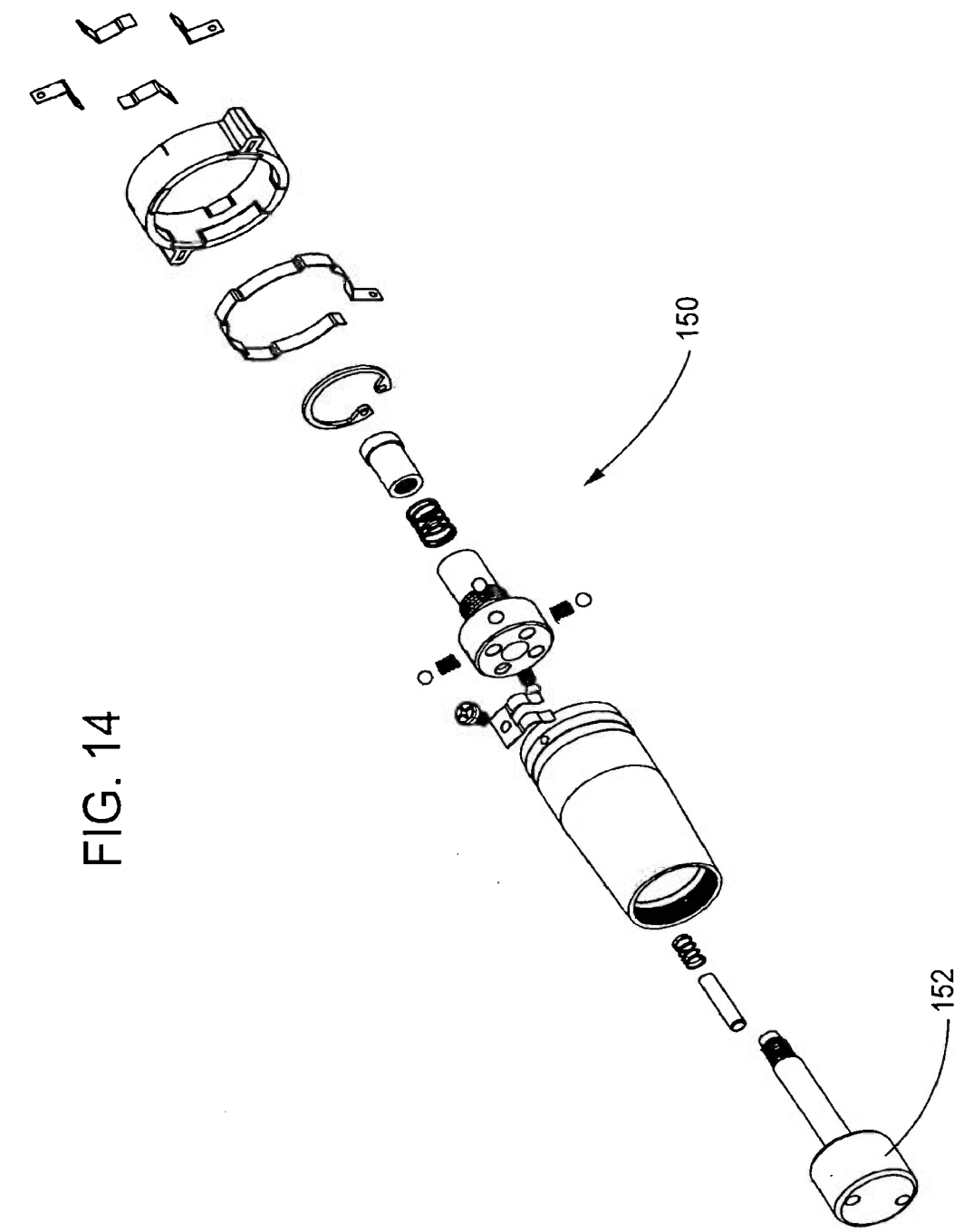


FIG. 14

FIG. 15

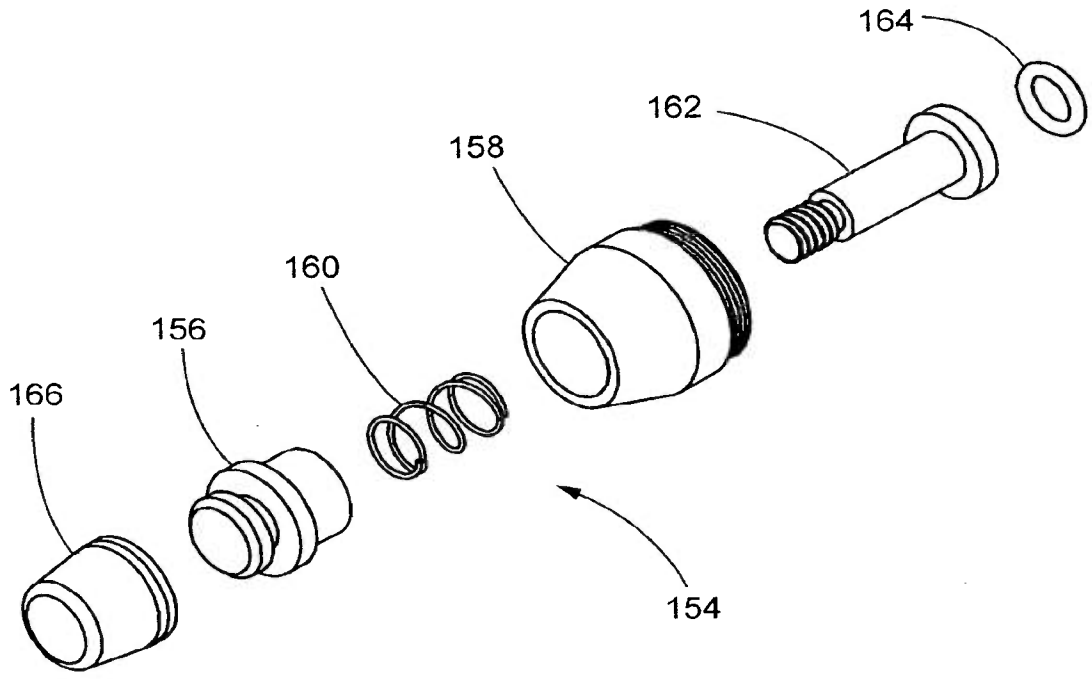
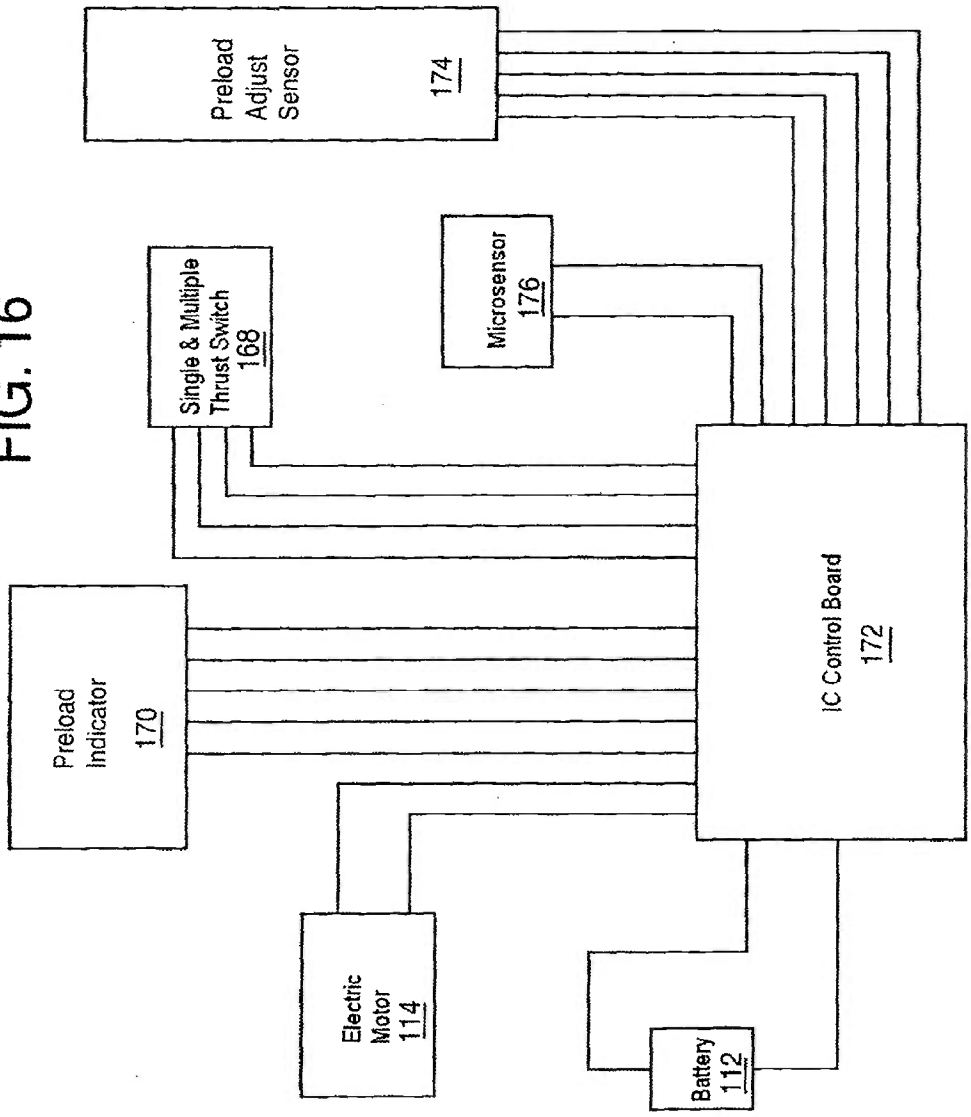


FIG. 16


Preload Adjust Sensor 174
Single & Multiple Thrust Switch 168
Microsensor 176
Preload Indicator 170
IC Control Board 172
Electric Motor 114
Battery 112
1. Direct current will not cause electrical shock
2. All wiring is electrically insulated by a reinforced plastic exterior

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2008/006982

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - A61H 1/00 (2008.04)
USPC - 606/239
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(8) - A61H 1/00, 5/00, 23/02, 39/04 (2008.04)
USPC - 601/46, 67, 68, 97, 101, 107, 108; 606/237-239

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)
PatBase

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,228,042 B1 (DUNGAN) 08 May 2001 (08.05.2001) entire document	1, 2, 4, 7-10
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Y		3, 5, 6
Y	US 2006/0293711 A1 (KELLER et al) 28 December 2006 (28.12.2006) entire document	3, 5, 6
A	GB 2 275 196 A (CIRONE) 24 August 1994 (24.08.1994) entire document	1-10
A	US 2003/0195443 A1 (MILLER) 16 October 2003 (16.10.2003) entire document	1-10
A	US 2,078,159 A (REDDING) 20 April 1937 (20.04.1937) entire document	1-10

☐ Further documents are listed in the continuation of Box C. ☐

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"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
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"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
15 October 2008	27 OCT 2008
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

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(54) Title: FACIAL CARE APPARATUS AND ATTACHMENTS

(57) Abstract: A facial care apparatus comprising a main housing, a handgrip portion on the main housing, a motor drive mechanism inside the main housing and a moveable head to be driven by the motor drive mechanism. The motor drive mechanism is to drive the movable head in a reciprocating sliding motion during operation.

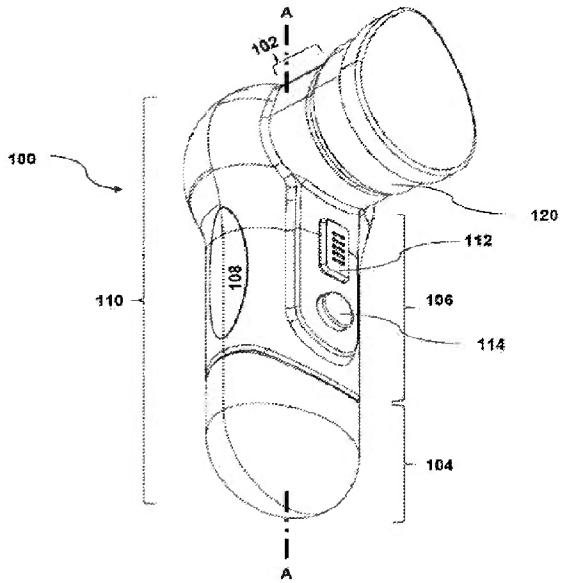


Figure 1

MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— *as to the identity of the inventor (Rule 4.17(i))*

Published:

— *with international search report (Art. 21(3))*

Facial care apparatus and attachments

Field

[001] The present disclosure relates to facial care apparatus, and more particularly to handheld facial care apparatus having a motor driven facial care head. More particularly but not exclusively, the present disclosure relates to handheld motorized powder puff applicators and accessories therefor.

Background

[002] Facial care apparatus such as facial cleansers, facial brushes or cosmetic applicators are useful to enhance personal grooming. Handheld facial care apparatus with a motorized facial care applicator are gaining increasing popularity, and it would be beneficial to provide improvements to such motorized facial care apparatus.

Summary

[003] There is provided a facial care apparatus comprising a main housing, a handgrip portion on the main housing, a motor drive mechanism inside the main housing and a moveable head to be driven by the motor drive mechanism; wherein the motor drive mechanism is to drive the movable head in a reciprocating sliding motion during operation. A reciprocating sliding motion of the movable head has been found to be particularly efficient in applying facial care substances such as cosmetic or powder to the face of a user. The movable head may project from the main housing orthogonally to the handgrip axis or at an obtuse angle to the handgrip axis. The obtuse angle may have a value between 125 and 145 degrees.

[004] In an example, the handgrip portion is elongate and defines a handgrip axis, and the movable head is to slide reciprocally along a sliding axis which is parallel to the handgrip axis when driven by the motor drive mechanism.

[005] In an example, the sliding axis is an axis of symmetry of the main housing.

[006] In an example, the movable head is to slide back and forth relative to a neutral position, the sliding amplitude being within 3mm from the neutral position, preferably within 2mm.

[007] In an example, the movable head is to slide back and forth relative to a neutral position, the sliding frequency being less than 20 Hz, or less than 10Hz, or less than 7Hz.

[008] The motor drive mechanism may comprises an eccentric drive conversion mechanism to convert rotational motion generated by a motor of the motor drive mechanism into a linear reciprocating sliding motion of the movable head. An eccentric drive mechanism is beneficial as it is more compact and silent compared to a gear drive mechanism.

[009] The eccentric drive conversion mechanism may comprise an eccentric crank which is mounted on the motor shaft of the motor such that an eccentric drive pin on the eccentric crank moves around the motor shaft axis to convert rotation of the motor shaft into linear reciprocating motion of the movable head during operation.

[0010] In an example, the movable head comprises a powder puff applicator, the powder puff applicator being for applying a cosmetic or a skin care powder onto the face of a user.

[0011] In another aspect, there is described a facial care apparatus comprising a main housing, a handgrip portion on the main housing and defining a handgrip axis, a motor drive mechanism and a moveable head to be driven by the motor drive mechanism; wherein the motor drive mechanism is to drive the movable head into a first reciprocating motion and a second reciprocating motion superimposed on the first.

[0012] In an example, the first reciprocating motion may be a sliding motion which is to bring the movable head to slide parallel to the face of a user during normal use.

[0013] For example, the sliding motion may be parallel to the handgrip axis.

[0014] The frequency of the sliding motion may be less than 20 Hz, or less than 10Hz, or less than 7Hz.

[0015] In an example, the first reciprocating motion is a padding or tapping motion which is to bring the movable head is to pad on the face of a user during normal use, the padding motion being at an angle, or orthogonal, or substantially orthogonal to the face of a user.

[0016] For example, the padding motion is at an angle to the handgrip axis.

[0017] The frequency of the padding motion may be less than 100 Hz, or less than 80Hz, or less than 60Hz.

[0018] The amplitude of the first reciprocating motion may be within 3mm of a neutral position, or within 2mm.

[0019] The second reciprocating motion may be a vibration.

[0020] For example, the vibration may be generated by a vibration source, such as a micro motor, mounted on the moveable head.

Description of Figures

[0021] Example facial care apparatus and accessories therefor will be described by way of non-limiting examples with reference to the accompanying Figures in which:

Figure 1 is a perspective view of a facial care apparatus according to the present disclosure,

Figure 2 is a plan view of the apparatus of Figure 1,

Figure 2A is a cross-sectional view of the apparatus of Figure 1 taken along the handgrip axis A-A',

Figure 3 is an exploded view of the apparatus of Figure 1,

Figure 4 is a perspective view of the facial care apparatus of Figure 1 with the facial care attachment detached,

Figure 5 is a perspective view of another example of a facial care apparatus according to the present disclosure,

Figure 6 is a partially exploded view of the apparatus of Figure 5,

Figure 7 is schematic view showing a drive mechanism of the apparatus of Figure 5, and

Figure 8 is front view of the drive mechanism of Figure 7, and

Figure 8A a cross-sectional view of the drive mechanism of Figure 8 taken along line C-C'.

Description

[0022] A facial care apparatus **100** depicted in Figures 1 to 4 comprises a main housing **110** and a movable head **120** projecting from the main housing. The main housing **110** comprises a hollow plastic housing which defines a neck portion **102**, an end portion **104** and a handgrip portion **106** intermediate the neck portion and the end portion. The neck portion **102** includes a peripheral wall defining a collar portion which projects from one longitudinal end of the main housing. This neck portion provides an interface region for the

movable head to mechanically couple with the main housing and the motor drive mechanism inside the main housing **110**.

[0023] The handgrip portion **106** is elongate and is shaped and sized to facilitate ergonomic holding of the apparatus by a user during normal use. The elongate handgrip portion **106** defines a handgrip axis A-A' which extends longitudinally through the center of the main housing and defines an axis of lateral symmetry of the main housing. An anti-slid surface **108** is formed on each of the lateral sides of the handgrip portion **106** to mitigate hand slipping during normal use when a user holds the apparatus by the handgrip portion **106** with the movable head facing and approaching the facial skin of a user. The main housing 110 also defines a motor drive mechanism compartment for housing a motor drive mechanism and a battery compartment for housing batteries to power the motor drive mechanism. The motor drive mechanism comprises a motor **142** and a drive mechanism **144** which is driven by the motor to bring the movable head into a reciprocating motion during operation. To facilitate single handed operation, operation switches **112**, **114** are disposed on the side of the main housing on which the movable head projects.

[0024] The motor **142** is mounted on an axis of symmetry of the main housing with its shaft intercepting the handgrip axis at a right angle to drive the movable head. As shown in Figure 2, the drive mechanism **144** is arranged to convert rotation of the motor shaft into a linear reciprocating motion to drive the movable head **120** and comprises a first eccentric **146**, a second eccentric **148**, and a slide limiting member **150**. Each of the 1st and 2nd eccentrics **146**, **148** comprises a disc member and an eccentric drive pin that is offset from the center of the disc and parallel to a rotation axis of the disc which passes through the disc center. The first eccentric is mounted on the motor shaft, the second eccentric **148** is mounted on top of the eccentric drive pin of the first eccentric **146** in a freewheeling manner such that it is free to rotate with respect to the first eccentric, and the eccentric drive pin of the second eccentric is confined in a linear slot on the slide limiting member **150**. When the motor shaft is in rotation, the eccentric pin of the second eccentric ('second eccentric pin') will undergo a linear reciprocating motion along the liner slot of the slide limiting member **150** due to confinement in the linear slot.

[0025] The top or free end of the second eccentric pin is mounted to the underside of a base member **122** of the movable head in order to bring the movable head to move in synchronization with the second eccentric pin. With the combination of the motor and the drive mechanism, rotation of the motor will be converted into a linear reciprocating motion along the direction of the handgrip axis, and this linear reciprocating motion drives the movable head into a reciprocating sliding motion on the skin of a user during use. The base

member **122** serves as a movable platform which is covered by a plastic cap **124** to form a complete movable head.

[0026] The facial care apparatus **100** can be configured to perform different types of skin or facial care operation depending to a large extent on the type of applicator head on the movable head **120**. For example, the facial care apparatus **100** will operate as a motorized cosmetic applicator when a cosmetic applicator is on the moveable head. Also, the facial care apparatus **100** will operate as a motorized powder puff applicator when a powder puff applicator **160** is carried on the movable head. Alternatively, the facial care apparatus **100** will operate as a motorized facial cleanser when the movable head carries a cleansing brush.

[0027] During operation, a user will hold the handgrip portion of the apparatus using one hand and turn on the motor by operating the ON/OFF switch **114**. When the ON/OFF switch **114** is in the ON position, the motor will obtain power from the batteries **116** and drive the movable head into a reciprocating sliding motion to perform a designated skin care function as determined by the applicator on the movable head **120**. To perform facial care operations, a user will bring the applicator head on the movable head to act against the face of a user and the moving applicator head will move back-and-forth on the face to perform a designated skin care operation. In general, the movable defines a facial or skin care surface which is parallel to but off-set from the handgrip axis A-A'.

[0028] In an example configuration, the handgrip portion is palm-sized and the reciprocating motion of the movable head has the following specification:

Sliding frequency	6.7Hz
Sliding amplitude	± 2mm
Driving torque	400 g.cm

[0029] For example, when the apparatus carries a powder puff applicator on the movable head, cosmetic powder will be applied onto the face of a user by means of a sliding motion characteristic of this apparatus. The sliding motion resembles a rubbing motion which has been found to enhance skin care performance. The compact drive mechanism has resulted in a compact design such that the total length of the apparatus is about or less than 13 cm.

[0030] In a variation of this example, the skin care apparatus **100** may include a second reciprocating motion source which is to generate a reciprocating motion to superimpose on the first reciprocating motion generated by the primary motion source of the motor **142**. More specifically, a micro-motor **152** as an example of a secondary motion source is mounted on

the platform of the movable head with its shaft parallel to the handgrip axis A-A' and carrying an eccentric weight.

[0031] In operation, the eccentric weight of the micro-motor **152** will generate a second reciprocating motion which is to be superimposed on the primary reciprocating motion generated by the main or primary motor **142**. The second reciprocating motion may be parallel to, at an angle or, orthogonal or substantially orthogonal to the direction of the first or primary reciprocating motion which is a sliding motion in this example.

[0032] As depicted in Figure 2, the micro-motor **152** is mounted on a platform surface of the base member that is away or distal from the eccentric drive mechanism, and the shaft of this micro-motor **152** is substantially parallel to the platform surface and at an angle to handgrip axis. The second reciprocating motion is intended to be auxiliary or ancillary to the first reciprocating motion. Therefore, the second reciprocating motion has substantially smaller amplitude compared to the amplitude of the first reciprocating motion. For example, the amplitude of the second reciprocating motion can be, for example, less than 1/10th, 1/20th, or 1/30th of the first reciprocating motion. In addition, the second reciprocating motion has a substantially higher frequency compared to the first reciprocating motion. For example, the micro-motor **152** may operate at 10 times, 20 times or 30 times or even higher of the frequency of the first reciprocating motion generated by the primary motor **142**.

[0033] When operating the apparatus **100** with both the first and the second reciprocating motion in operation, the second reciprocating motion will appear as a higher frequency vibration superimposed on the sliding motion. In use, a user will operate a mode selection switch **112** to select the mode to operate. Example modes which are available include:- a first mode of sliding motion only, a second mode of sliding motion in combination with vibration, and a third mode of vibration only. In the example of Figure 1, an example vibration frequency of 200 Hz is used.

[0034] While a micro-motor **152** is shown in Figure 1, it will be appreciated that the apparatus **100** can be with or without the micro-motor **152** as a source of the second reciprocating motion. In such a case, the mode selection switch **112** can be dispensed of or allocated for other functions without loss of generality.

[0035] As mentioned above, different types of facial care attachments can be attached to the movable head **120** of the facial care apparatus to perform different facial care functions. In the example of Figure 1, the facial care attachment is an applicator head **160** configured as a powder puff applicator which is releasably mounted on the moveable head **120**. The

applicator head **160** comprises a plastic cap which is complementary to the movable mead such that the applicator head **160** can be press or friction fitted on the movable head **120**.

[0036] As depicted in Figures 1 to 4, the movable head and the applicator head has a tapered end so that the tip of the applicator can engage with corner portions of the face of a user. This tapered or water droplet or tear shaped applicator has been found to further enhance facial care performance, whether as a facial powder puff applicator, as a brush or as a cosmetic applicator, because the tapered tap can more effectively negotiate corners on the face of a user.

[0037] Another example of a facial care apparatus **200** is depicted in Figures 5 to 8. This facial care apparatus has a substantially identical construction to that of the apparatus **100** of Figure 1 except that the drive mechanism to produce the first reciprocating motion is different. The description on the first apparatus **100** is incorporated herein by reference except the drive mechanism and numerals of the related parts are added by 100 where appropriate and for succinctness.

[0038] Similar to the facial care apparatus **100**, the drive mechanism **244** of this facial care apparatus **200** comprises a main or primary motor **242** and an eccentric mechanism to convert the rotation of the motor into a first reciprocating motion, although the first reciprocating motion is in a direction parallel to the motor axis or orthogonal to the handgrip axis. The eccentric mechanism includes a 1st eccentric **246** which is mounted on a free end of the motor shaft in a freewheeling manner. An eccentric pin on the 1st eccentric **246** is connected to a crank arm **244** which is confined to move up and down an aperture formed on a slide limiting member **250**. In this example, the first reciprocating motion is a padding motion or a tapping motion which is to apply orthogonally to the facial surface of a user and the first reciprocating motion is orthogonal or substantially orthogonal to the facial surface. To produce this orthogonal padding motion, the motor shaft in this example is parallel to handgrip axis and an eccentric is provided to convert the rotation of the motor shaft into a linear stroking or tapping motion characteristic of facial padding. An example range of tapping force is between 1 to 2 N.

[0039] In an example configuration, the reciprocating tapping motion of the movable head has the following specification:

tapping frequency	80 Hz
tapping amplitude	± 2mm

Tapping	1.8N

[0040] In a variation, the tapping motion may be at an angle to the facial surface of a user, and the crank arm **244** will then move at an angle to the motor axis for application of force at an angle.

[0041] In a variation to the example apparatus of Figure 5, a micro motor **252** is mounted on the movable head **220** to produce an optional second reciprocating motion to be superimposed on the first reciprocating motion. Similarly, the second reciprocating motion is intended to be auxiliary or ancillary to the first reciprocating motion and has substantially smaller amplitude compared to the amplitude of the first reciprocating motion. For example, the amplitude of the second reciprocating motion can be, say, less than 1/10th, 1/20th, or 1/30th of the tapping amplitude. The micro-motor **252** is to operate at a substantially higher frequency and the frequency of the second reciprocating motion can be several times the frequency of the first reciprocating motion generated by the motor **242**. For example, the frequency of the second reciprocating motion can be 2 times, 2.5 times, 3 times, 3.5 times, 4 times or a selected frequency between the specified multiple of the frequency of the first reciprocating motion. In this variation, the vibration frequency is at 200Hz.

[0042] In this variation, the vibration generated by the eccentric weight on the micro-motor can be in the same direction or at an angle to the tapping motion generated by the first reciprocating motion without loss of generality.

[0043] While the above examples have been used to explain the disclosure, it should be appreciated that the examples are non-limiting examples and should not be used to limit or restrict the scope of disclosure. For example, the movable head projects at right angle to the handgrip axis in the examples, but the angle of projection can be an obtuse angle of more than 90 degrees to the handgrip axis. For example, the angle can be between 125 degrees and145 degrees. Furthermore, while the example apparatus have been illustrated with detachable facial care attachments as examples of applicator heads for mounting onto a movable head, it should be appreciated that the movable heads can be built with skin care applicators without loss of generality.

Table of numerals

100				200	
102	Neck portion	142	Main motor	242	Main motor
104	End portion	144	Drive mechanism	244	Drive mechanism
106	Handgrip portion	146	1st eccentric	246	Eccentric
108	Anti-slid surface	148	2nd eccentric	246	Crank arm
110	Main housing	150	Slide limiting member	250	Slide limiting member
112	Mode switch				
114	ON/OFF switch				
116	Batteries				
120	Movable head				
122	Base member	152	Secondary motor	252	Secondary motor
124	Plastic cap				

Claims

1. A facial care apparatus comprising a main housing, a handgrip portion on the main housing, a motor drive mechanism inside the main housing and a moveable head to be driven by the motor drive mechanism; wherein the motor drive mechanism is to drive the movable head in a reciprocating sliding motion during operation.

2. A facial care apparatus according to Claim 1, wherein the handgrip portion is elongate and defines a handgrip axis, and the movable head is to slide reciprocally along a sliding axis which is parallel to the handgrip axis when driven by the motor drive mechanism.

3. A facial care apparatus according to Claim 2, wherein the sliding axis is an axis of symmetry of the main housing.

4. A facial care apparatus according to any of the preceding Claims, wherein the movable head is to slide back and forth relative to a neutral position, the sliding amplitude being within 3mm from the neutral position, preferably within 2mm.

5. A facial care apparatus according to any of the preceding Claims, wherein the movable head is to slide back and forth relative to a neutral position, the sliding frequency being less than 20 Hz, or less than 10Hz, or less than 7Hz.

6. A facial care apparatus according to any of the preceding Claims, wherein the motor drive mechanism comprises an eccentric drive conversion mechanism to convert rotational motion generated by a motor of the motor drive mechanism into a linear reciprocating sliding motion of the movable head.

7. A facial care apparatus according to Claim 6, wherein the eccentric drive conversion mechanism comprises an eccentric crank which is mounted on the motor shaft of the motor such that an eccentric drive pin on the eccentric crank moves around the motor shaft axis to convert rotation of the motor shaft into linear reciprocating motion of the movable head during operation.

8. A facial care apparatus according to any of the preceding Claims, wherein the movable head comprises a powder puff applicator, the powder puff applicator being for applying a cosmetic or a skin care powder onto the face of a user.

9. A facial care apparatus according to Claim 6, wherein the powder puff applicator is releasable from the movable head.

10. A facial care apparatus according to Claim 7, wherein the powder puff applicator comprises an adapter housing on which a soft powder puff is carried, the adapter housing comprising a cap which is for closely fitted mount on the movable head.

11. A facial care apparatus according to any of the preceding Claims, wherein the movable head is to vibrate at a vibration frequency about the sliding axis while undergoing sliding motion.

12. A facial care apparatus according to Claim 11, wherein the vibration frequency is substantially higher than the sliding frequency during operation.

13. A facial care apparatus according to Claim 11, wherein the vibration frequency is at least 10 times, 20 times or 30 times higher than the sliding frequency during operation.

14. A facial care apparatus according any of Claims 11 to 13, wherein the vibration is at amplitude substantially lower than the sliding amplitude during operation.

15. A facial care apparatus according any of Claims 11 to 14, wherein the vibration amplitude is less than 1/10th, 1/20th, or 1/30th of the sliding amplitude.

16. A facial care apparatus according any of Claims 11 to 15, wherein the vibration is generated by a vibration source mounted on the moveable head.

17. A facial care apparatus according to Claim 16, wherein the vibration source comprises a micro-motor carrying an eccentric weight member on the shaft of the micro-motor, the eccentric being to rotate in a direction orthogonal to the handgrip axis or sliding axis.

18. A facial care apparatus according to any of the preceding Claims, wherein the movable head projects in a direction orthogonal to the handgrip axis and comprises a facial contact surface, the facial contact surface being parallel to the handgrip axis or parallel and the slide directions.

19. A facial care apparatus according to any of the preceding Claims, wherein the movable head comprises a tapered end on an axial end distal from the handgrip portion.

20. A facial care apparatus according to any of the preceding Claims, wherein the movable head defines a facial contact surface having a water drop shape or a tear shape.

21. A facial care apparatus comprising a main housing, a handgrip portion on the main housing and defining a handgrip axis, a motor drive mechanism and a moveable head to be driven by the motor drive mechanism; wherein the motor drive mechanism is to drive the movable head into a first reciprocating motion and a second reciprocating motion superimposed on the first.

22. A facial care apparatus according to Claim 21, wherein the first reciprocating motion is a sliding motion which is to bring the movable head to slide parallel to the face of a user during normal use.

23. A facial care apparatus according to Claim 21, wherein the sliding motion is parallel to the handgrip axis.

24. A facial care apparatus according to Claims 21 or 23, wherein the frequency of the sliding motion is less than 20 Hz, or less than 10Hz, or less than 7Hz.

25. A facial care apparatus according to Claim 21, wherein the first reciprocating motion is a padding motion which is to bring the movable head is to pad on the face of a user during normal use, the padding motion being at an angle, or orthogonal, or substantially orthogonal to the face of a user.

26. A facial care apparatus according to Claim 24, wherein the padding motion is at an angle to the handgrip axis.

27. A facial care apparatus according to Claims 24 or 25, wherein the frequency of the padding motion is less than 100 Hz, or less than 80Hz, or less than 60Hz.

28. A facial care apparatus according to any of Claims 21 to 27, wherein the amplitude of the first reciprocating motion is within 3mm of a neutral position, preferably within 2mm.

29. A facial care apparatus according to any of Claims 21 to 28, wherein the second reciprocating motion is a vibration.

30. A facial care apparatus according to Claim 29, wherein the vibration is generated by a vibration source mounted on the moveable head.

31. A facial care apparatus according to any of the preceding Claims, wherein the movable head comprises a tapered end on an axial end distal from the handgrip portion.

32. A facial care apparatus according to any of the preceding Claims, wherein the movable head defines a facial contact surface having a shape resembling a water drop or a tear drop.

33. A facial care apparatus according to Claim 32, wherein the frequency of the vibration is more than 2 times, or more than 3 times of the frequency of the first reciprocating motion where the first reciprocating motion is a padding motion; and more than 10 times, or more than 20 times of the frequency of the first reciprocating motion where the first reciprocating motion is a sliding motion.

34. A facial care apparatus according to any of Claims 21 to 33, wherein the movable head comprises a powder puff applicator, the powder puff applicator being for applying a cosmetic or a skin care powder onto the face of a user.

35. A facial care apparatus according to Claim 34, wherein the powder puff applicator is releasable from the movable head.

36. A facial care apparatus according to Claim 35, wherein the powder puff applicator comprises an adapter housing on which a soft powder puff is carried, the adapter housing comprising a cap which is for closely fitted mount on the movable head.

37. A facial care attachment for use with a facial care apparatus according to any of the preceding Claims, the attachment comprising an adapter housing on which a soft powder puff applicator is carried, wherein the adapter housing comprises a cap for closely fitted mount onto the movable head of a facial care apparatus.

38. A facial care attachment according to Claim 37, wherein the soft powder puff applicator comprises a tapered end on an axial end distal from the handgrip portion.

39. A facial care attachment according to Claim 38, wherein the soft powder puff defines a facial contact surface having a shape resembling a water drop or tear drop.

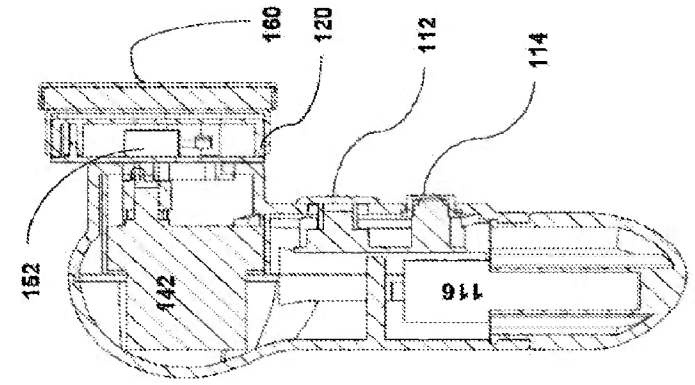


Figure 2A

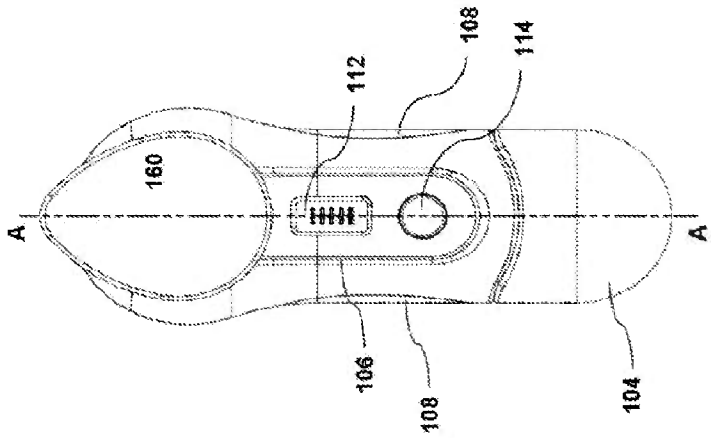


Figure 2

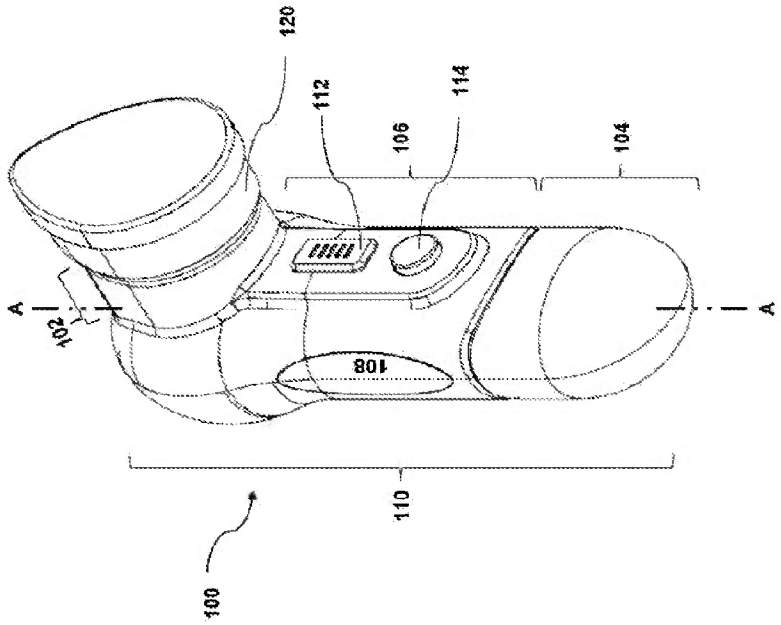


Figure 1

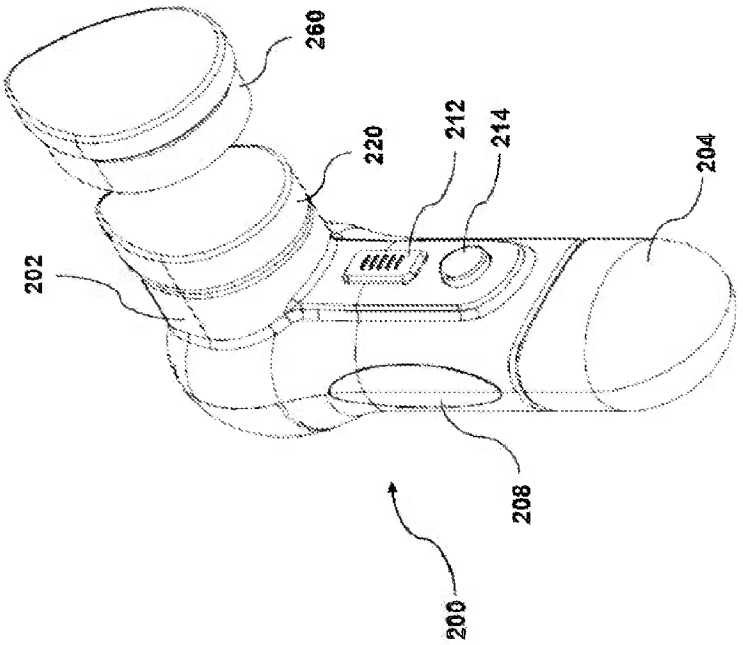


Figure 4

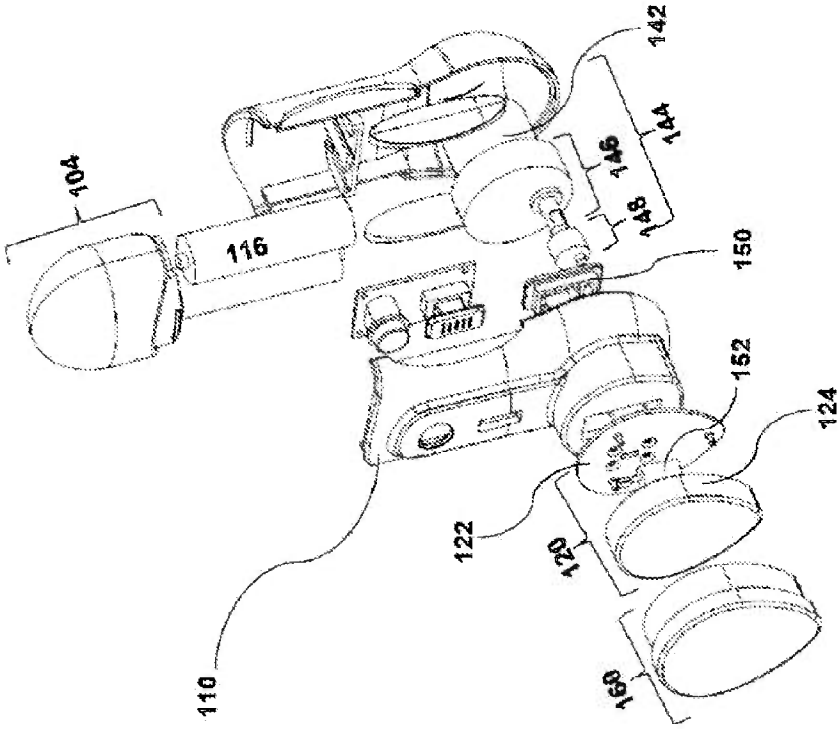


Figure 3

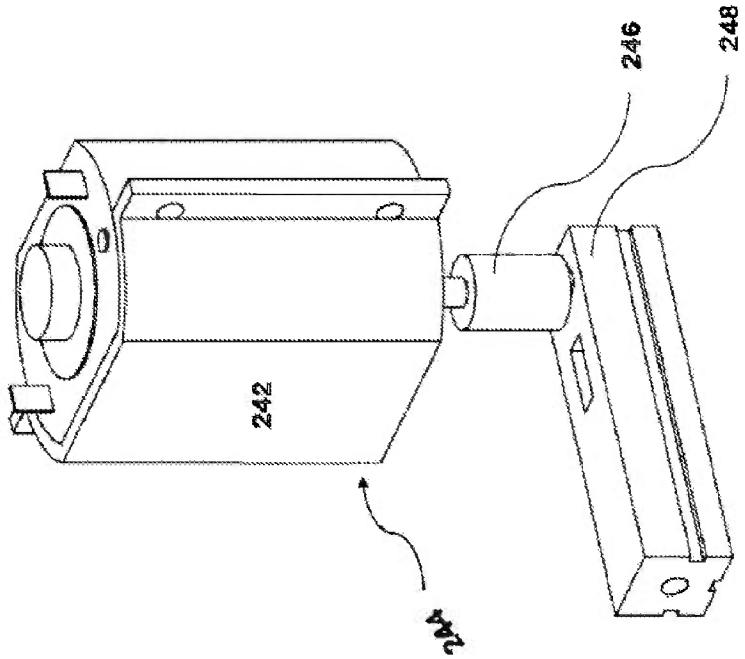


Figure 7

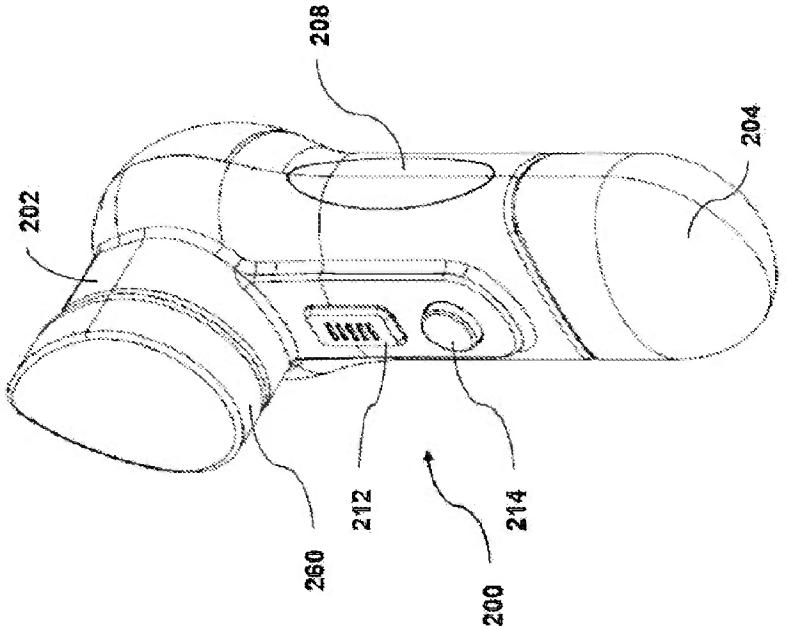


Figure 5

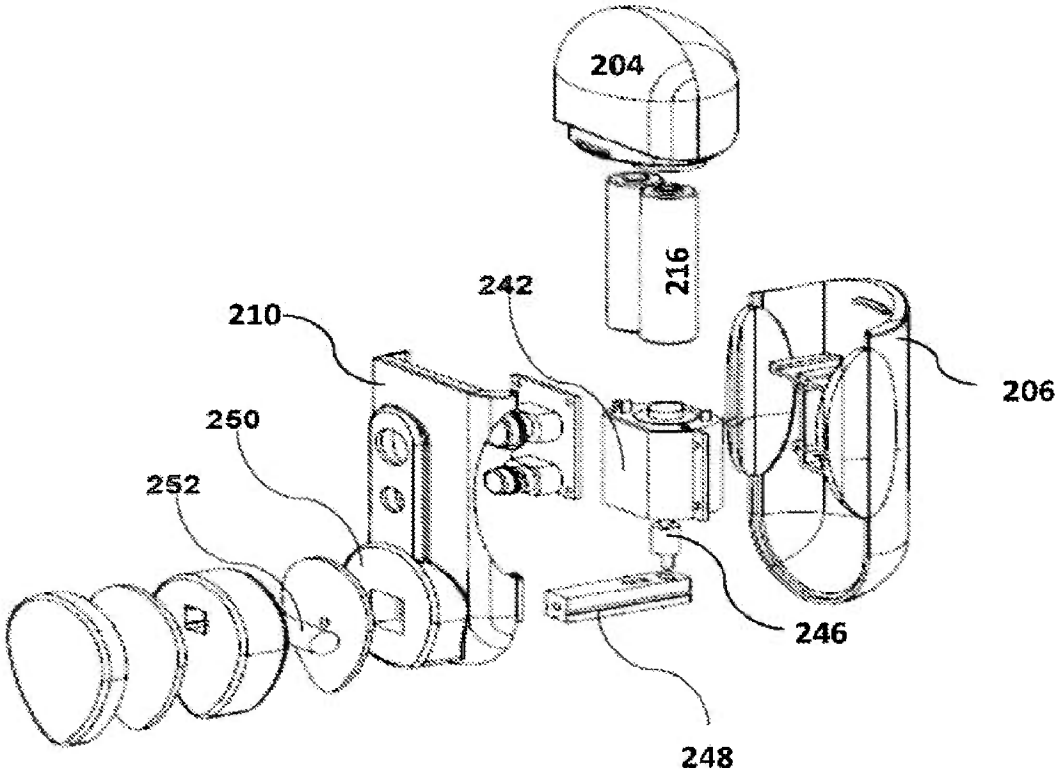


Figure 6

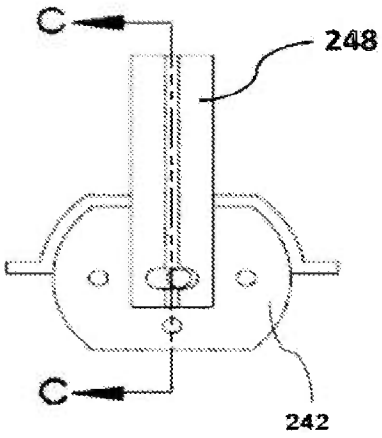


Figure 8

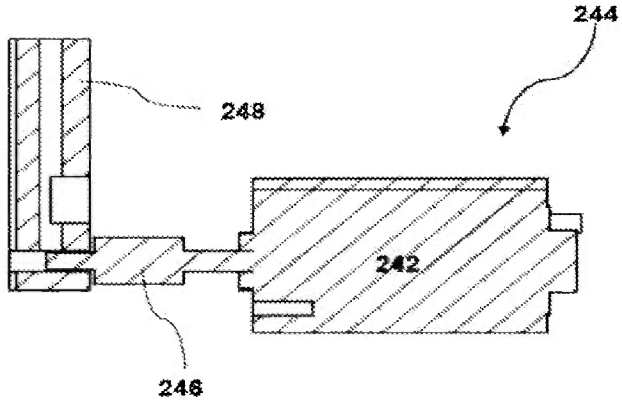


Figure 8A

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2013/050853

A. CLASSIFICATION OF SUBJECT MATTER

See the 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: A61H, A47K, B62B, A46B

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)

EPODOC,WPI,CNPAT,CNKI: facial, handgrip, motor, move, slide, vibrate

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 201108577 Y (DONG, Changhui) 03 September 2008 (03.09.2008) description, pages 1-2, figures 1-3	1-10, 18-20, 37-39
X	US 2010/0222719 A1 (COWIE, Ross et al.) 02 September 2010 (02.09.2010) the whole document	1-10, 18-20, 37-39
X	CN 2100174 U (HUANG, Lihua et al.) 01 April 1992 (01.04.1992) the whole document	1-10, 18-20, 37-39
A	JP 2007-222207 A (MATSUSHITA ELECTRIC WORKS LTD.) 06 September 2007 (06.09.2007) the whole document	1-39
A	CN 101272888 A (MATSUSHITA ELECTRIC WORKS LTD.) 24 September 2008 (24.09.2008) the whole document	1-39

☐ 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

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"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
15 October 2013 (15.10.2013)	**07 Nov. 2013 (07.11.2013)**
Name and mailing address of the ISA/CN The State Intellectual Property Office, the P.R.China 6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China 100088 Facsimile No. 86-10-62019451	Authorized officer PENG,Yan Telephone No. (86-10)82245089

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INTERNATIONAL SEARCH REPORT

International application No.
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Continuation of:

A. CLASSIFICATION OF SUBJECT MATTER

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A47K 7/00 (2006.01) i

B26B 7/00 (2006.01) n

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/IB2013/050853

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN 201108577 Y	03.09.2008	None	
US 2010/0222719 A1	02.09.2010	WO 2010/100527 A1	10.09.2010
		KR 20110134892 A	15.12.2011
CN 2100174 U	01.04.1992	None	
JP 2007-222207 A	06.09.2007	JP 4775028 B2	21.09.2011
CN 101272888 A	24.09.2008	WO 2007/037251 A1	05.04.2007
		JP 2007089698 A	12.04.2007
		EP 1935585 A1	25.06.2008
		KR 20080035020 A	22.04.2008
		US 2009/0241343 A1	01.10.2009
		DE 602006020749 E	28.01.2011
		JP 4715425 B2	06.07.2011
		KR 100963728 B	14.06.2010
		CN 101272888 B	19.05.2010
		HK 1121716 A	03.09.2010
		AT 501818 T	15.04.2011
		EP 1935585 B1	16.03.2011
		RU 2381893 C2	20.02.2010

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(54) Title: A STIMULATION AND TREATMENT DEVICE

(57) **Abstract**: A stimulation and treatment device has a housing with a wide first end part and a narrow second end part. A transducer mounted inside the wide first end part of the housing housing generates linear motion in response to applied power, and a rounded protrusion extending from the first end part of the housing is mechanically connected to the transducer and correspondingly moved such that the motion can be applied to a patient. A control module mounted inside the narrow first end of the housing is configured to control the delivery of power to the electromechanical transducer. The wide first end part is substantially spheroidal, and the narrow second end part is substantially cylindrical and extends from the substantially spheroidal first part at the opposite side from the movable rounded protrusion. The shape and distribution of weight results in a user friendly and ergonomically correct device that can be programmed or configured to be useable for a wide range of treatment procedures.

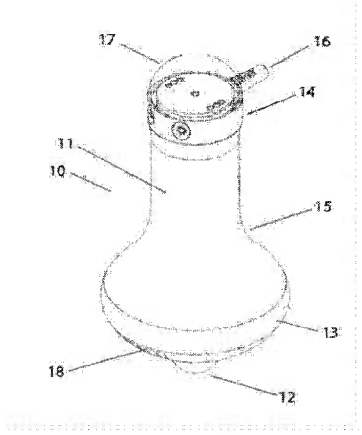


Fig. 1

WO 2015/038005 A2

A STIMULATION AND TREATMENT DEVICE

FIELD OF THE INVENTION

[001] The present invention relates to a device for stimulation or treatment of the human body, and in particular to a device for percussive stimulation or treatment of specific points of the human anatomy.

BACKGROUND OF THE INVENTION

[002] The human skin and underlying tissue contains numerous receptors which are sensitive to touch, pressure, stretching and temperature. These receptors are distributed over the whole area of the human body in different depths. The sensitive area is known as the "receptive field", which exists in the skin and in the tissue below the skin, in the muscles, the sensory and motor nerves, nerve endings, in the wall of blood vessels, and surface membrane of the bone.

[003] These receptors are, under different conditions, sensitive in a selective fashion to stimulation parameters of forces applied to them, such as the direction, the power (mostly activated by a gentle force), and the frequency. By selective (or tuned) activation, these receptors signal the perception of the stimulation to the central nervous system, initiating processes within the body, and causing a comfortable relaxing sensation.

[004] Stimulation of these receptors, or nerve sections, through stimulation of the skin is also believed to influence on organs, hormones and the metabolism, directly or in combination, for example providing enhanced communication therebetween. For this use, the stimulation must be relatively robust and firm in order to reach the required depth.

[005] Stimulation of the skin and the underlying tissue by massage is also important in the case of injury, to improve and rehabilitate damaged tissue. In many cases, the use of controlled movement of skin and tissue is needed, and therefore, the direction, force and frequency must be accurately adjustable, to have an influence on the tissue.

[006] Stimulation methods are typically based on application of pressure to the surface of the skin by a therapist, through finger depression and motion, or by mechanical devices. However, the therapist cannot develop the required directional movement with great accuracy, or in a constant rhythm, and it is difficult for the therapist to maintain these movements for long periods of time, due to fatigue. The resulting stimulation effects are therefore short term. Additionally, the therapist will be able to access only a few receptors in each pressure application. Existing mechanical devices, such as massage products that will target and focus on muscle groups and larger tissue areas, are typically inadequate for the use described above.

[007] Percussive stimulation devices developed for example for chiropractic treatment, are known in the art, but they are often limited in their functionality such that they do not lend

themselves to any range of different therapeutic approaches and treatment of different areas of the body, they are uncomfortable to work with for the therapist, particularly over time, and they suffer from technical limitations that limit their durability and their ability to operate continuously over a prolonged period of time without malfunctioning.

[008] A chiropractic adjustment tool described in US patent 6,663,657, which is hereby incorporated by reference in its entirety, is illustrative both of the state of the art and its shortcomings. The publication describes a device which can deliver a single impact when energized. If the device had been configured to deliver strokes at a given frequency over time it would have been uncomfortable for the operator to use and sideways wobble would have been generated by the strokes as a result of the pistol grip which is outside the axis defined by the movable parts of the device.

[009] US published patent application 2013/0138023, which is hereby incorporated by reference in its entirety, describes a device for massaging or treatment of the back and neck muscles of a patient. The publication describes how a variable voltage can be applied to a drive motor in order to linearily move a massaging finger with a variable frequency range. The shape and distribution of weight results in an unwieldy and impractical device for prolonged use at different positions and angles.

[010] Therefore it is desirable to provide devices that are ergonomically correct and comfortable to use, that are able to reach different depths of the treated area of the body and target the desired receptors and nerve sections, and that are able to be operational for a prolonged period of time.

SUMMARY OF THE INVENTION

[011] The present invention aims at providing devices where the ergonomical and functional issues described above are overcome or at least significally reduced, and to provide enhanced functionality and applicability to a number of therapeutic programs and approaches, including self-treatment by the patient.

[012] In a first embodiment, the invention provides a stimulation and treatment device having a housing with a wide first end part and a narrow second end part. A transducer is mounted inside the wide first end part of the housing and configured to generate linear motion in response to applied power. A control module mounted inside the narrow first end of the housing and configured to control the delivery of power to the electromechanical transducer. The control module may control delivery of power to the transducer such that the device can operate with the appropriate force and frequency.

[013] A rounded protrusion extending from the first end part of the housing is mechanically connected to the transducer such that the rounded protrusion can be moved relatively to the housing when the transducer is operative.

[014] The first end part of the device is substantially spheroidal, and the narrow second end part is substantially cylindrical and extends from the substantially spheroidal first part at the opposite side from the movable rounded protrusion. The transition from the wide first end to the narrow second end produces a middle part of the housing with a concave profile.

[015] In some embodiments of the stimulation and treatment device, the side of the wide first end part from which the narrow second part extends, may constitute a gripping surface such that the narrow second part will extend between the thumb and the index finger of an operator when the device is in use.

[016] According to one aspect of the invention, the stimulation and treatment device, the center of gravity is inside the substantially spheroidal first end part of the device and on or near the axis defined by the linear motion generated by the transducer. In this way the device is not subject to any substantial wobble in any other direction than along the axis defined by the linear motion generated by the transducer, which is also the direction of force applied by the operator of the device. The position of the center of gravity can be obtained through adaptation of the weight and relative position of the transducer, the control module, and the shape, length and material of the housing.

[017] Various embodiments of stimulation and treatment devices consistent with the principles of the invention may include different types of transducers. In particular, the transducer may be a mechanical or electromechanical transducer chosen from the group consisting of: a solenoid, an electric motor, and a pneumatic transducer.

[018] In embodiments where the transducer is a solenoid or an electric motor, the control module can be an electronic control module. This control module can be configured to deliver the necessary power in terms of voltage and frequency to obtain the desired movement of the solenoid.

[019] In order to avoid overheating, it is desirable to dissipate the heat generated by the transducer (e.g. a solenoid). A solenoid positioned outside the hand of the operator, and perhaps even outside the housing itself, might be sufficiently cooled by the natural flow of air around the device. However, due to the inventive shape of the device and the position of the solenoid inside it, the problem of heat dissipation is part of the larger problem of providing a device with a shape, wheight distribution and functionality in terms of movement described above. In some embodiments of the invention, a stimulation and treatment device is provided with a plurality of ventilation openings, a passage or channel allowing air to pass from at least

one first ventilation opening, past the transducer and out of at least one second ventilation opening. An electric fan can be mounted in or adjacent to the channel or passage and configured to produce a flow of air in through the at least one first ventilation opening, through the channel or passage, and out through the at least one second ventilation opening. The channel or passage may be constituted by the internal surface of the housing, and the external surface of the transducer.

[020] According to another embodiment of the invention, a stimulation and treatment device includes a housing, an electromagnetic transducer mounted iside the housing and configured to generate linear motion in response to applied electric power, an electronic control module mounted inside the housing and configured to control the delivery of electric power to the electromechanic transducer, a plurality of ventilation openings, a passage or channel allowing air to pass from at least one first ventilation opening, past the transducer and out of at least one second ventilation opening, and an electric fan mounted in or adjacent to the channel or passage and configured to produce a flow of air in through the at least one first ventilation opening, through the channel or passage, and out through the at least one second ventilation opening.

BRIEF DESCRIPTION OF THE DRAWINGS

[021] For a better understanding of the invention, a detailed description of various embodiments and aspects will now be presented with reference to the attached drawings, in which like numerals designate corresponding elements or sections of the device embodiments, and in which:

FIG. 1 is a perspective view of a stimulation and treatment device consistent with certain aspects of the invention;

FIG. 2 is a perspective view of a stimulation and treatment device illustrating certain alternative aspects of the invention;

FIG. 3 is a side view showing an example of an internal assembly arranged inside the device; and

FIG. 4 is a bottom view of a device consistent with the principles of the invention.

DETAILED DESCRIPTION

[022] In the following description of various embodiments it should be noted that, unless otherwise stated, different aspects can be freely combined with each other whether or not they have been described together with reference the same embodiment below. The combination of features and aspects in the exemplary embodiments are done in order to facilitate understanding of the invention rather than limit its scope to a limited set of embodiments.

Furthermore, those with skill in the art will understand that the invention may be practiced without many of the details included in this detailed description. Conversely, some well-known structures or functions may not be shown or described in detail, in order to avoid unnecessarily obscuring the relevant description of the various implementations. The terminology used in the description presented below is intended to be interpreted in its broadest reasonable manner, even though it is being used in conjunction with a detailed description of certain specific implementations of the invention.

[023] Reference is first made to FIG. 1, which is a perspective view of a device 10 for stimulation or treatment of the human body. The device 10 comprises a housing 11 which encloses an assembly which constitutes a majority of the movable parts generating the stimulation motion and force that is appliced to the treated area of the body, as well as electrical and electronic components for energizing and controlling this motion. The internal assembly will be described in further detail below.

[024] A rounded protrusion 12 is extending from a first end part or portion or section 13 of the housing 11. The rounded protrusion 12 is mechanically connected to a transducer which is part of the internal assembly and will be described in further detail below. The rounded protrusion 12 can be moved relative to the housing by the transducer, and the motion can be applied to the body of a patient during treatment.

[025] The housing 11 shown in FIG. 1 is elongated, concentric and rounded in both end parts 13, 14. The diameter is larger at the first end part 13 and more narrow at the second end part or portion or section 14, and the change in diameter of the overall shape of the housing 11 follows a concave profile such that the diameter increases more rapidly closer to the first end, giving the device a pear-shape or gourd-shape. The shape can also be described as having a first end part 13 which is substantially spheroid and a narrow second end part 14 which is substantially cylindrical. The second end part 14 extends from the wider first end part 13 at the opposite side from the rounded protrusion 12, and the transition from the wide first end to the narrow second end part produces a middle part (or portion or section) 15 with a concave profile.

[026] This shape allows an operator to hold the device 10 in one hand with the palm enclosing or resting against the surface of the middle part 15 of the housing that deviates most from being parallel to the direction of motion of the protrusion 12 (where the first end part 13 ends and the middle part 15 begins), facilitating application of force by the operator while at the same time providing a comfortable grip and maneuverability with respect to the direction of the device 10 against the treated area of the patient's body.

[027] While held in this manner the second end part 14 extends backwards between the thumb and the index finger of the operator and, in embodiments where the second end part 14 does not extend too far or contain too many heavy parts, the device will be well balanced and the center of gravity remains inside the operators grip. By distributing weight around the axis defined by the motion generated by the transducer, and by using a transducer which itself has its center of gravity in or near this axis, the center of gravity will, in addition to being inside the operators grip, be on or near the axis of motion, which is also coaxial with the direction of force applied by the operator. Consequently, essentially all force applied by the various components of the device and by the operator will be in one direction, and there will be no wobble or drift in any other direction. This is an aspect of the invention which facilitates accuracy of applied strokes and force, as well as ergonomy and comfort for the operator.

[028] When the first end part 13 is referred to as being substantially spheroidal, this should be understood as having a shape that has a spheroidal appearance to an observer, without any significant observable deviation from a spheroidal shape, except from in the transitional middle part area. However, any egg shaped form and any deviation from a purely spheroidal shape which is inside 20%, for example a deviation of about 10%, should in any case be considered to be substantially spheroidal in the context of the invention. Similarly, substantially cylindrical should be understood as having a shape that has a circular or oval cross-section and with parallel sides, although the sides may taper towards the end or, alternatively be more narrow in the concave transitional area. Also the center of the substantially cylindrical end part 14 does not have to be a straight line. For example, the substantially cylindrical end part 14 may equally well be curved.

[029] The shapes referred to is also only intended to describe the overall shape, and not any local ribs, ridges, grooves, slits or other shapes intended to facilitate or provide a better or more comfortable grip, higher friction against the hand of the operator, the presence of control buttons, holes or vents etc.

[030] The second end part 14 of the device 10 may comprise a display element 17. The display element 17 may show information relating to the operating mode of the device and considered useful for the operator, such as stroke length of the rounded protrusion 12, force, frequency of the applied strokes, time the device has been in use, etc.The information displayed by the display element 17 may be controlled by an electronic control module, as described further below. The display element 17 in this embodiment includes indicators that indicate power on and mode of operation in the form of lights that are on, off, or a particular color.

[031] The second end part 14 may further be adapted for manual stimulation. By turning the device around, placing the second end 18 of the device on the patient in the area of the body

to be stimulated, and then moving or pressing the device towards the patient, the operator can stimulate or massage the patient manually, or locate nerve endings or other points that should be subject to treatment. In order to facilitate this the second end 18 may be rounded or at least without any sharp edges. The material of the upper end of the housing may be different from the material of the rounded protrusion, for example it may be of a material or with a surface texture with lower friction against human skin. The material may also be transparent in order to provide a view of the display element 17.

[032] In use, the rounded protrusion 12 is positioned on the skin of a patient and the operator grips the housing 11 with his/her hand and presses the device against the patients body with a force suitable for reaching the receptors at that position and obtain the desired effect. The particular effect desired in a specific situation will depend on the patient, the area of the body to be treated, which receptive fields or trigger points it is desirable to reach, and the type of treatment or stimulation method that is applied. Various embodiments of the invention may be specifically adapted to or programmable to be used in accordance with modern as well as alternative and traditional treatment and does not concern itself with the relative efficiency of a particular type of treatment.

[033] The stimulation device illustrated in FIG. 1 further comprises a connection for electric power in the form of a power cable 16 (only the beginning of which is illustrated in the drawing). As an alternative to power cord connection the device may include batteries, for example a rechargeable nickel–cadmium (NiCd), nickel–metal hydride (NiMH) or lithium-ion (Li-ion) battery. When designing an embodiment with batteries the designer would have to take into consideration the weight of the battery, the desired force and frequency of the strokes delivered by the device and desired duration of operation. The specific characteristics of the unit used to convert electrical power to motion in the internal assembly of the device 10 as well as the heat generated by the battery during discharge may also be factors that will have to be taken into consideration. The characteristics of available batteries, both with respect to type and voltage, are well known and a particular choice must be left as a design choice depending on the desired combination of featrues and capabilities of a specific embodiment.

[034] The surface of the device 10 may also include openings 19 for ventilation allowing heat generated by the internal assembly to escape. In the embodiment illustrated in FIG. 1 such openings 19 are shown near the first end 13 of the device 10 where the surface begins to curve back towards the center axis of the device 10 (the bottom of the gourd-shape). This placement ensures that the openings will not be covered by the hand of the operator during operation. However, depending on the softness of the tissue treated and the depth of the stimulated point in the patients body, there is a risk that the openings 19 may be resting

against the skin of the patient and thereby be partially or fully blocked. This will be disussed in further detail below.

[035] FIG. 2 shows a perspective view of a stimulation device 20 for stimulating skin and underlying tissue. The stimulation device 20 is similar to the stimulation device shown in FIG. 1 and comprises an ergonomically shaped housing 21 and a movable rounded protrusion 12 arranged in a lower end 13 of the housing 21. The rounded protrusion 12 is connected to an internal assembly arranged within the housing 21. The internal assembly will be described in further detail below.

[036] The housing 21 illustrated in FIG. 2 has the same elongated, concentric shape and is concentric in both end parts 13, 14, with the diameter in the lower end part 13 being larger than in the upper end part 14, and increasing more rapidly towards the first end, giving the housing 21 a pear or gourd-like shape.

[037] This embodiment is illustrated with a display element 27 at the rounded second end 18 showing the number 10%, which for example may indicate that the device is working at 10% of maximum power. Other information may also be shown, such as stroke length of the rounded protrusion 12, force used on the patient, frequency of the applied strokes, time the device has been used, etc. The rounded second end 14 may further be adapted for manual stimulation, by turning the device around, as described with reference to FIG. 1.

[038] The housing 21 has in this embodiment, in the middle section 15 where an operator will rest the palm of his hand, a number of ribs 28 which are arranged to provide friction and thus a better grip when an operator uses the stimulation device. The ribs 28 may for example be made of rubber, silicone or other material which enhances the grip of the hands, or they may simply be protruding from the surface of the housing 21. Other textures or materials that may increase the friction and improve the grip may also be chosen. Instead of ribs 28, the housing may also be provided with grooves, slits or openings in the middle section.

[039] The stimulation device shown in FIG. 2 is illustrated with a similar power cord connection 16 as the one shown in FIG. 1, and the same applies with respect to the alternative of using batteries.

[040] The various features illustrated in FIG. 1 and FIG. 2, respectively, are not mutually exclusive. Instead they may be freely combined, for example in that the display unit 17 may be combined with the ribs on the middle section of housing 21, and even in a display unit with both the indicator lights of display unit 17 and the alphanumerical or graphical display showing number (or other information) in display unit 27.

[041] Turning now to FIG. 3, which shows a first view of an exemplary embodiment of the internal assembly, the functionality of the device when it is energized will be explained.

[042] At the heart of the device is a motor, or transducer. Generally speaking a transducer is a device that converts a signal in one form of energy to another form of energy. In the present description the transducer converts supplied energy into linear motion. In the embodiment illustrated in FIG. 3 the motor is an electromagnetic solenoid 31, but other alternatives are consistent with the principles of the invention, including, for example, a rotary electric motor combined with an assembly for converting rotary to linear motion, or a pneumatic actuator which produces the desired linear motion when provided with air with the appropriate pressure.

[043] The solenoid 31 illustrated in FIG. 3 comprises an electromagnetically inductive coil wound around a movable armature of a magnetic material such as steel or iron. The coil is shaped such that the armature can be moved in and out of the center, altering the coil's inductance and thereby becoming an electromagnet. The control of the current fed to the inductive coil will control the magnetic field and thus the movement of the armature within the coil. The solenoid 31 may be controlled directly by a controller circuit 32, and thus have very short reaction times.

[044] The force applied to the armature is proportional to the change in inductance of the coil with respect to the change in position of the armature, and the current flowing through the coil (Faraday's law of induction). The force applied to the armature will always move the armature in a direction that increases the coil's inductance.

[045] The solenoid 31 may be configured to move the rounded protrusion 12 backwards, away from the patient when power is applied, such that a spring (not shown) is loaded. When the power is no longer applied the spring will release its power and the rounded protrusion 12 will be moved towards the patient by the spring, delivering a stroke. Alternatively, application of power may move the armature, and thereby the rounded protrusion 12, directly toward the patient, and a return spring may return it to its original position when the power is released.

[046] An example of the former is ZHM-1445S Massager Solenoid, which is produced by Zonhen Electric Appliances of China. A data sheet published by Zonhen describes various parameters such as stroke length vs force at various combinations of frequency and power, and ampere-turns vs force at different stroke lengths. This can be used by a designer to configure the electronic control circuit 32 to deliver the necessary power relevant for a given procedure or protocol of treatment. This solenoid has a total weicht of 380g, which can be taken into consideration when designing for distribution of weight. The data sheet is hereby incorporated by reference.

[047] It will be realized that while a solenoid inherently is somewhat elastic since the armature does not have to complete motion in a first direction before it begins moving in the

opposite direction, this is not the case with a rotary electric motor unless additional components introduce such elasticity. Pneumatic actuators may be constructed such that the elasticity inherent in the compression and decompression of air is exploited, or they may be constructed such that complete movement in one direction is necessary to release air pressure before a new cycle begins. This elasticity, or damping, may be desirable in various applications because it may reduce discomfort for the operator as well as the patient when the rounded protrusion 12 hits harder tissue or bone.

[048] The rounded protrusion 12 is in this exemplary embodiment connected to the armature. Alternatively it can be a part of the armature or it can be integrated in the armature. The rounded protrusion 12 will thus move when the armature is moved in and out of the coil. In use, an operator will position the rounded protrusion 12 on the section of the body that is to be stimulated, either directly on the skin, or on clothes or other appropriate cover. The hands of the operator will hold the housing and press the rounded protrusion 12 toward the skin of the patient with an appropriate force and angle. In this way the operator can use his/her experience and knowledge to decide the force and direction of the stimulation, while the stimulation device provides additional stimulation, by the movement of the rounded protrusion. The stimulation device may be used without the additional stimulation, by not turning on the current fed to the inductive coil.

[049] In one embodiment the rounded protrusion 12 has a diameter of 2.5 cm, but other dimensions are consistent with the principles of the invention, for example anywhere within the range from 1 to 4 cm. The surface area of the part of the device which is in contact with the patient will then be approximately about 20 mm in diameter or greater, as determined by the size and shape of the rounded protrusion 12. This size may vary depending on the pressure applied manually by the operator, and in some embodiments of the invention additional variation may be obtained with different, replaceable operational units or heads which can be attached and detached according to need. At the very least varying diameters from 1 centimeter to 4 centimeters can be contemplated.

[050] In one embodiment, the maximum vertical displacement or displacement range (i.e., total vertical travel from extended position to retracted position) of the operational portion of the device, ie. the rounded protrusion 12, is about 10 mm, which may also be referred to as the stroke length of the device. In some embodiments the stroke lenght may be variable from about 0.5 mm to 10 mm. The operational force or hardness of the device is configured from 0% to 100%, with the maximum of at about 5 kgf. In addition, in operation there the device may be operated at speed or frequency of the operational portion of about 1 to 10 or greater beats / second.

[051] The various modes of operation with respect to stroke length (displacement), operational force and frequency may in some embodiments be controlled by way of an electronic circuit 32 which is supplied with electrical energy and which can be programmed to deliver an alternating voltage to the coil of the solenoid 31. The amplitude, shape and frequency of the voltage will determine the stroke length, force and frequency with which the rounded protrusion 12 stimulates the area to be treated. The electronic circuit must be designed in accordance with the capabilities of the chosen solenoid and the requirements of the treatment for which a particular embodiment is designed to be used.

[052] The electronic module 32 can be implemented in a number of ways which will be known to a person skilled in the art, ranging from analog oscillating circuits, use of timer circuits (such as the well known 555 timer), through use of programmable or pre programmed circuits such as EEPROMs, AISCs etc. The user interface may be constituted by buttons on the surface of the device or on a control unit (not shown) which is provided remotely and for example connected to the device over wires integrated in the power cable 16. It is also conceivable to provide a wireless interface using Bluetooth, Zigbee or some other standard protocol known in the art, and the user interface may then be provided on a separate device or in the form of an app running on a general purpose device such as a smart phone. The characteristics (pulse shape, amplitude and frequency) of the power delivered from the electronic module 32 to the solenoid 31 is dictated by the characteristics of the chosen solenoid 31 and the requirements of the programs it is desirable to be able to run on a particular embodiment. The electronic module may be connected to the display unit 17 (or 27 in FIG. 2) which may provide information regarding settings and operating status of the device to the operator, as explained above.

[053] The device may further comprise an air channel 33 adjacent to the solenoid 31 inside the housing 11 in order to provide cooling of the solenoid 31. The air channel 33 is arranged in heat exchanging contact with or a heat exchanging distance from the solenoid. The air channel 33 is illustrated in FIG. 3 only as in indication of how the air may flow. The air channel may typically be constituted by various internal surfaces of the housing 11, including additional internal protrusions, ridges and profiles directing the flow of air, as well as the outer surfaces of the solenoid 31. The air channel 33 may therefore not necessarily be a separate component, but rather a result of a design that deliberately avoids obstruction of air flow between an intake vent 34 and an outlet vent 35 in the housing 11. There may further be arranged a fan 36 in or near the air channel for providing airflow through the air channel 33 for further improvement of the cooling effect.

[054] FIG. 4 provides a bottom view of the device showing the relative positions of intake vents 34 and outlet vent 35. The view is from the first end of the device, showing the first end

part 13, which hides other parts and components from view, except from the power cable 16. The fan is positioned immediately behind the outlet vent 35 as seen in this view.

[055] In some embodiments the fan is RLF35-8/12/2HP-113, produced by ebm-pabst of Germany, a blower type fan which takes air in axially and blows air out radially. A datasheet published by ebm-pabst is hereby incorporated by reference in its entirety.

[056] The additional components and parts shown in FIG. 3 correspond to those shown in FIG. 1 and include the housing 11 itself with its first end part 13, second end part 14 and middle part 15. It can be seen from this drawing how the rounded end part 18, if made from a transparent material, will provide a view of the display 17 (or 27).

[057] The unit may be configured with pre-programmed operational settings including time of use and hardness settings for treatment of specific parts of the body. In some embodiments the device may be provided with e.g. a Bluetooth receiver (not shown) in order to facilitate wireless selection of programs or adjustment of the various settings with an external device, e.g., a mobile device such as a smartphone, a tablet and the like. The desired treatments may vary from one patient to another, and may depend on muscle mass, individual tolerance and the illness, injury or ailment to be treated. For example, for regular treatments of points rate may be 10 strokes/second, and from 3 degrees of hardness - hardness 30% - hardness 60% and hardness 90% of maximum hardness (Maximum hardness may be approximately 4 to 5 kg).

[058] Some other examples of hardness settings may be upper body hardness 30%, arms hardness 60%, hips hardness 60% - 90%, thigh hardness 90%, and feet and hands hardness 30%. It should be noted that the specific hardness required, as well as the frequency of the strokes, the duration of application as well as the number of repetitions and the length of any pause between repetitions is dependent on the specific treatment or program the operator wants to apply to the patient, and that the program itself or its effectiveness on the patient is not part of the invention as such. Rather, the invention is the provision of an apparatus that the operator, whether that is a health care provider, other practitioner or the patient him- or herself, can program and use in accordance with what the specific treatment requires.

[059] It is again emphasized that the requirements of the particular method, procedure, protocol or philosophy upon which a given treatment is based is not part of the invention as such. Numerous alternatives exist within the schools of modern medicin, alternative medicine as well as traditional (or folk) medicin, and range from treatment of diagnosed illnesses and ailments, through massage, to treatment intended to create relaxation or a feeling of well being, and embodiments of the invention can be configured to be adjustable or specifically designed for any of these.

[060] In one embodiment the stimulation device further comprises a display element arranged in the second end 14 of the device 10 and connected to the processing unit for displaying signals received from the processing unit.

CLAIMS

1. A stimulation and treatment device comprising:

a housing with a wide first end part and a narrow second end part;

a transducer mounted inside said wide first end part of said housing and configured to generate linear motion in response to applied power;

a control module mounted inside said narrow first end of said housing and configured to control the delivery of power to said electromechanical transducer; and

a rounded protrusion extending from the first end part of said housing and mechanically connected to said transducer;

wherein said wide first end part is substantially spheroidal, and said narrow second end part is substantially cylindrical and extends from the substantially spheroidal first part at the opposite side from the movable rounded protrusion; and

wherein the transition from the wide first end part to the narrow second end part produces a middle part of the housing with a concave profile.

2. A stimulation and treatment device according to claim 1, wherein the side of the wide first end part from which the narrow second part extends constitutes a gripping surface such that said narrow second part will extend between the thumb and the index finger of an operator when the device is in use.

3. A stimulation and treatment device according to claim 1 or 2, wherein the center of gravity is inside said substantially spheroidal first end part of said device and on or near the axis defined by the linear motion generated by said transducer.

4. A stimulation and treatment device according to claim 3, wherein the position of the center of gravity is obtained through adaptation of the weight and relative position of said transducer, said control module, and the shape, length and material of said housing.

5. A stimulation and treatment device according to any one of the previous claims, wherein said transducer is a mechanical or electromechanical transducer chosen from the group consisting of: a solenoid, an electric motor, and a pneumatic transducer.

6. A stimulation and treatment device according to claim 5, wherein said transducer is a solenoid or an electric motor and said control module is an electronic control module.

7. A stimulation and treatment device according to any one of the previous claims, further comprising:

a plurality of ventilation openings;

a passage or channel allowing air to pass from at least one first ventilation opening, past said transducer and out of at least one second ventilation opening; and

an electric fan mounted in or adjacent to said channel or passage and configured to produce a flow of air in through said at least one first ventilation opening, through said channel or passage, and out through said at least one second ventilation opening.

8. A stimulation and treatment device according to claim 7, wherein said channel or passage is constituted by the internal surface of said housing and the external surface of said transducer.

9. A stimulation and treatment device comprising:

a housing;

an electromagnetic transducer mounted iside said housing and configured to generate linear motion in response to applied electric power;

an electronic control module mounted inside said housing and configured to control the delivery of electric power to said electromechanic transducer;

a plurality of ventilation openings;

a passage or channel allowing air to pass from at least one first ventilation opening, past said transducer and out of at least one second ventilation opening; and

an electric fan mounted in or adjacent to said channel or passage and configured to produce a flow of air in through said at least one first ventilation opening, through said channel or passage, and out through said at least one second ventilation opening.

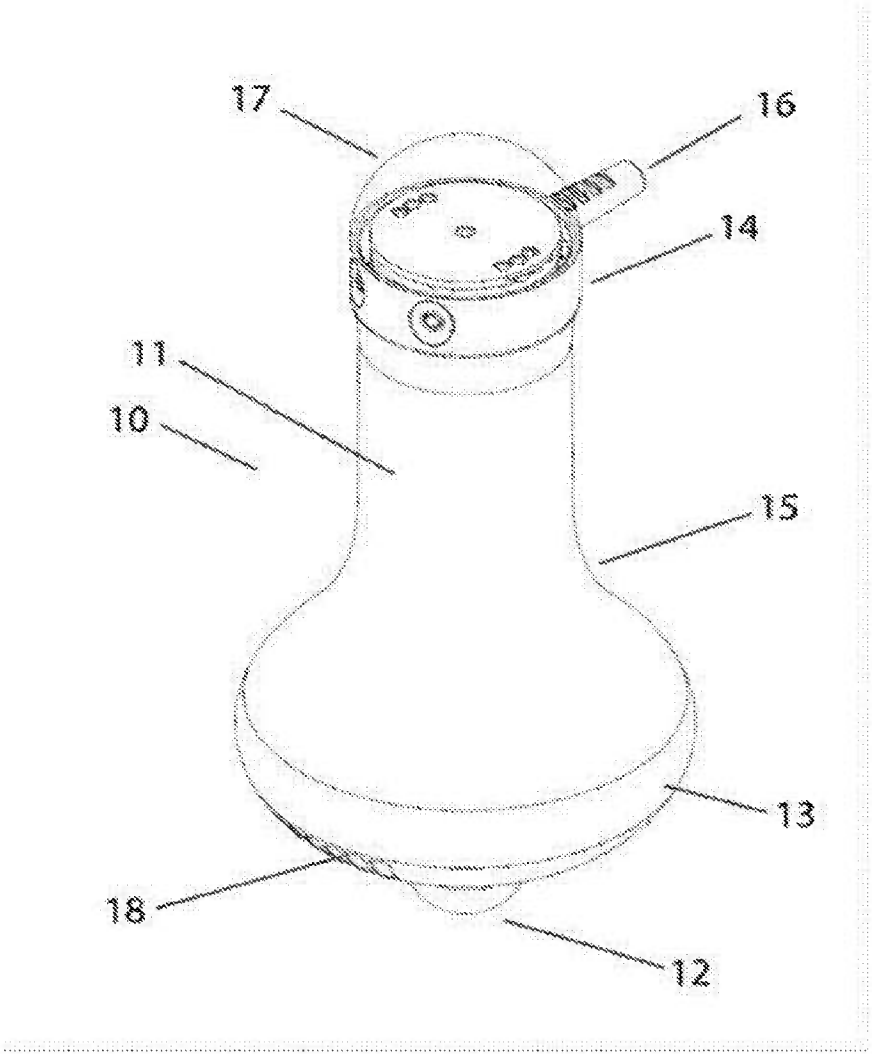


Fig. 1

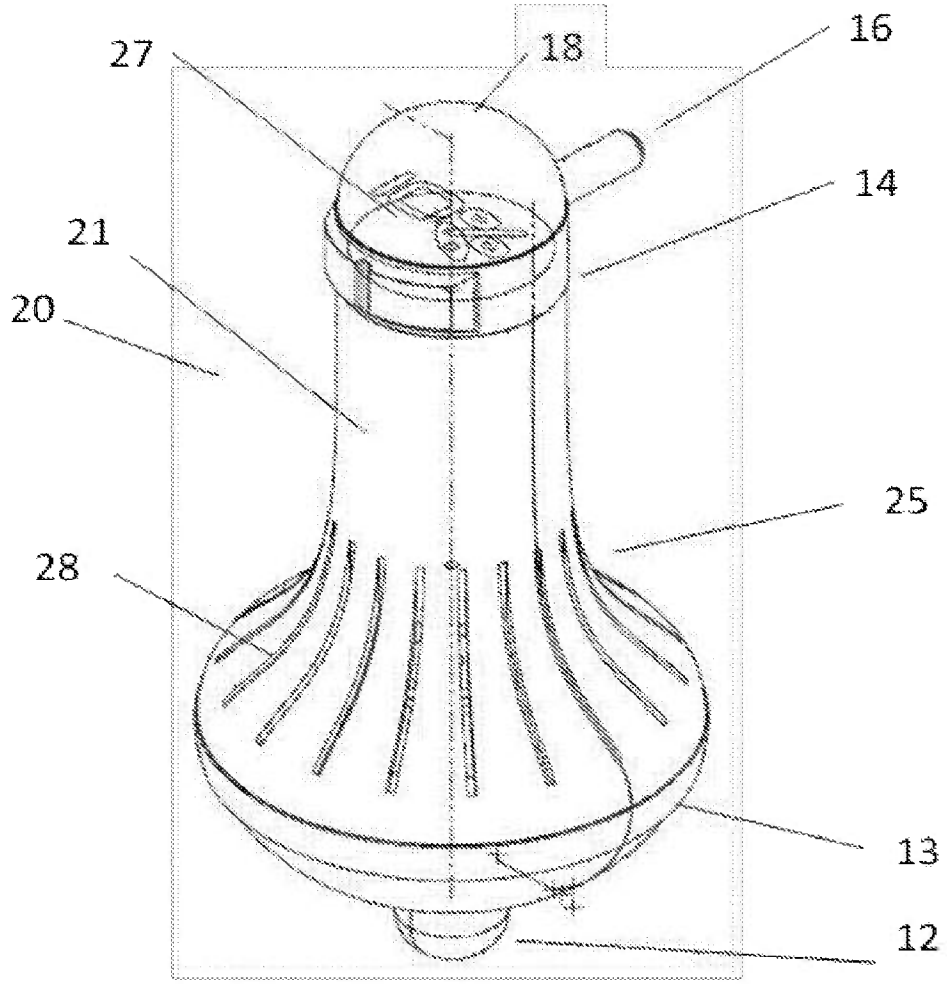


Fig. 2

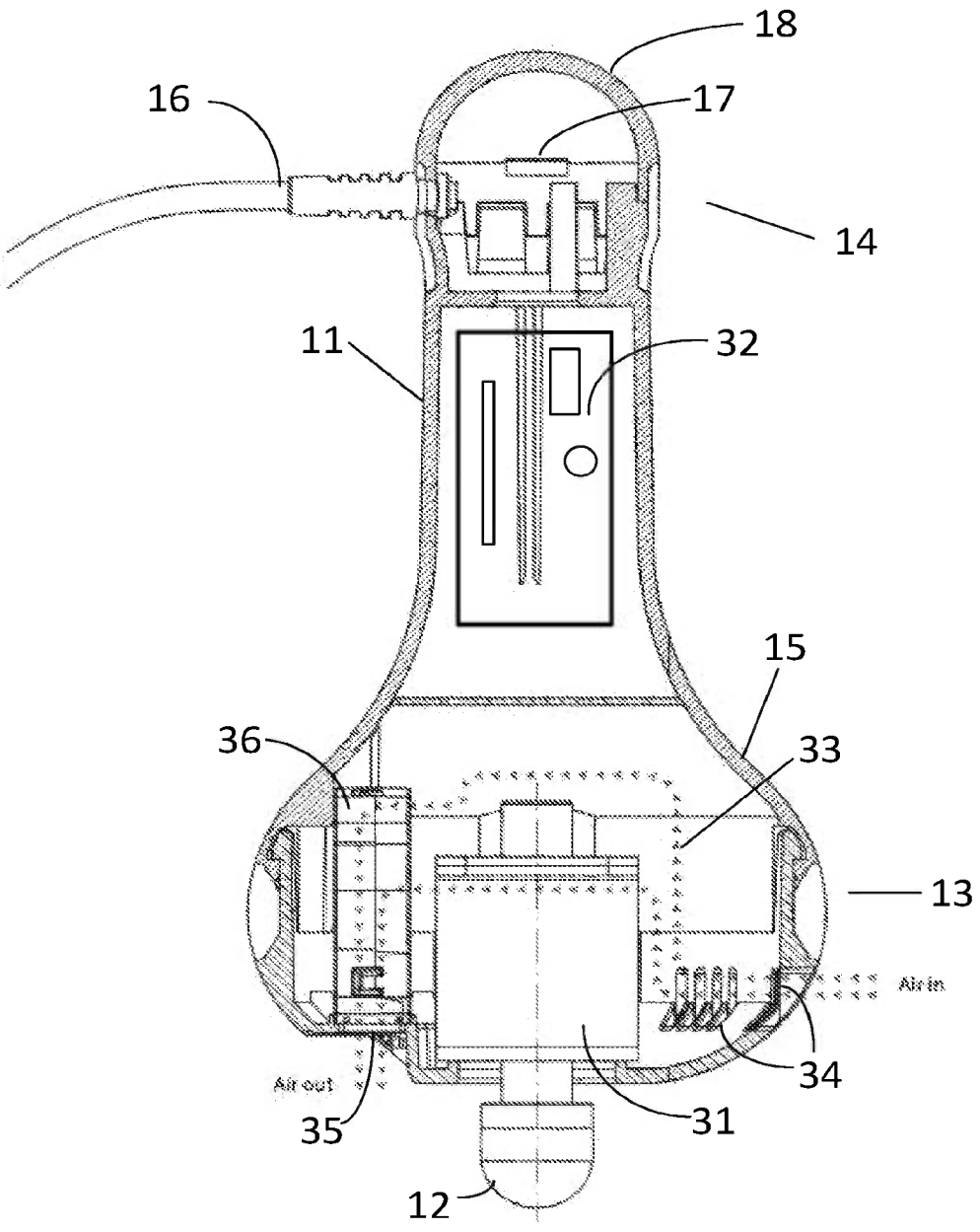


Fig. 3

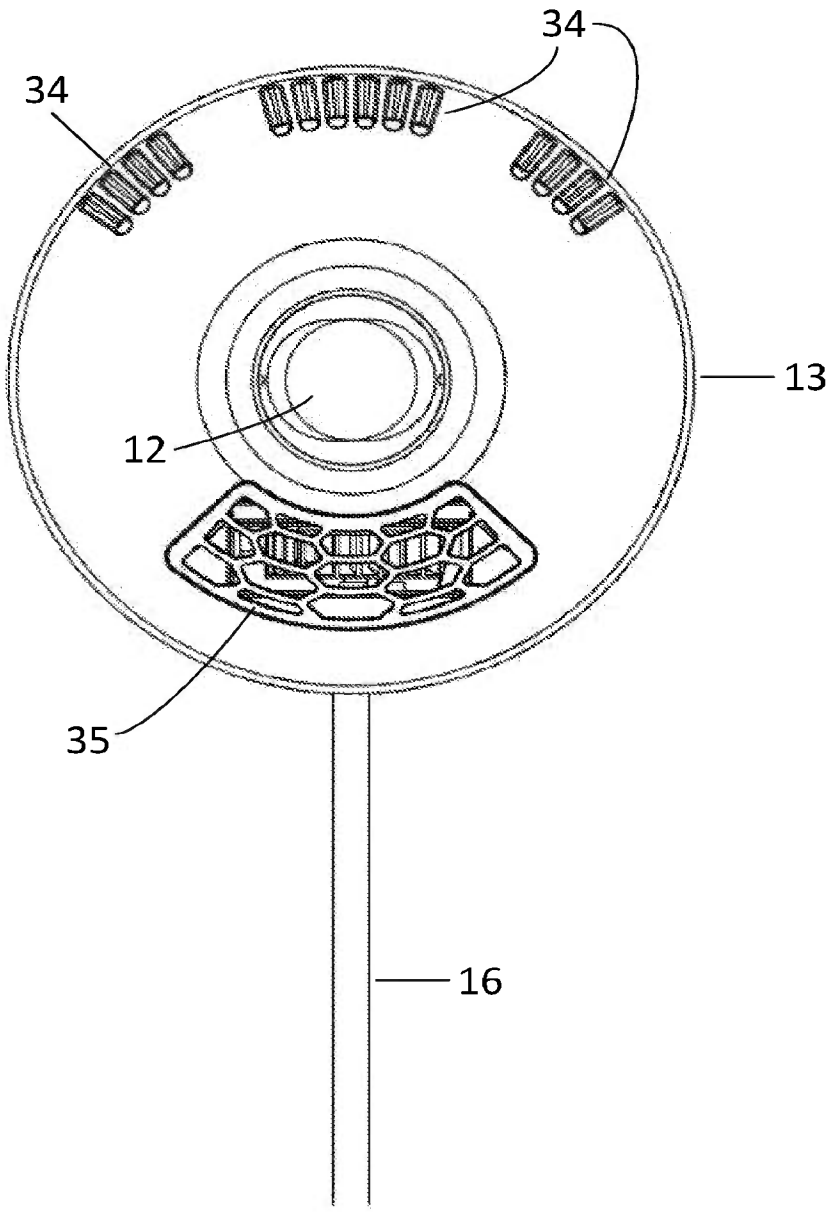


Fig. 4

Electronic Acknowledgement Receipt

EFS ID:	39819461
Application Number:	16869402
International Application Number:	
Confirmation Number:	4812
Title of Invention:	PERCUSSIVE THERAPY DEVICE
First Named Inventor/Applicant Name:	Jason Wersland
Customer Number:	24574
Filer:	Brennan C. Swain/Sharon Duncan
Filer Authorized By:	Brennan C. Swain
Attorney Docket Number:	76840-5077
Receipt Date:	24-JUN-2020
Filing Date:	07-MAY-2020
Time Stamp:	17:43:25
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	76840_5077_IDS_Transmittal_Letter.pdf	141343 1ac5bf225a248afef7e693be6c665b6d1bcabc804	no	2

Warnings:

Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	76840_5077_IDS.pdf	1419268 f3f04efd325c3ca3f210125b632dd53a368d dbfa	no	9
Warnings:					
Information:					
3	Non Patent Literature	AU_2016284030_Examination_ Report.pdf	100229 3750f2f4c0bc703d3579e7522111bd66135 a6342	no	3
Warnings:					
Information:					
4	Non Patent Literature	CA_2990178_OfficeAction_102 52018.pdf	460369 f02a42853c4620d8e9f3e38d6ad815bcf83d f405	no	4
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5	Non Patent Literature	Instructables_Jigsaw_Massager _18Apr2010.pdf	652923 85392d5183ccd56fbde2ee1adfa28d21b3a dc5e7	no	6
Warnings:					
Information:					
6	Non Patent Literature	JP_2018517683_OfficeAction_ 10_25_2018.pdf	438501 30a4983f12ea9c512539de4a100e60b26d2 05137	no	10
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7	Non Patent Literature	PCTUS2016038326_Internation alSearchReport_09012016.pdf	584751 bf5c44790d918cb80520682ebdae53ddc68 f70ca	no	9
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8	Non Patent Literature	PCTUS2018022426_Internation alSearchReport_05312018.pdf	574707 d5604d843acdb13f289d5ffffc51f3c422fc3d 9e	no	10
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9	Non Patent Literature	Rockwell_Trans4mer_Operating_Manual.pdf	2858161 c0a62bd04f9cb56d1541096278e6cbc7540 3a6f8	no	32
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10	Non Patent Literature	Worx_Transformer_Safety_Operating_Manual.pdf	1551511 ebb0472229c8252dc54b8d9f07ace7bf5d5 7b671	no	16
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11	Foreign Reference	JP_003077837.pdf	254628 55fb22ae40f6c672704f463195b40beacbc4 4ff5	no	7
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12	Foreign Reference	JP_1990019157_Sanden.pdf	219664 54fa7d2bfd75b53fa3be0313cbc2d2f2bf56 9244	no	6
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16	Foreign Reference	KR_101123926_ATSystem.pdf	645304 112478478fdd50d0a99f4eaa0e9d25448865fb50	no	8
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18	Foreign Reference	WO_2014118596_Telefield_Limited.pdf	863441 5912d6b1d6f2a6a473277ef12f6805f3a00d3147	no	22
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19	Foreign Reference	WO_2015038005_Nevroflex.pdf	1052648 0237364d4c5af8b0a9bf0cf01fa8e7d1b0f2012c	no	20
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Information:					
		Total Files Size (in bytes):	14494528		

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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.

IN THE PATENT AND TRADEMARK OFFICE

In re patent application of: WERSLAND, Jason Serial No. 16/869,402 Filed: May 7, 2020 PERCUSSIVE THERAPY DEVICE	**Confirmation No. 4812** Group Art Unit: 3785 Examiner: STUART, Colin W. Customer No. 24574 Docket No. 76840-5077

Commissioner For Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT
UNDER 37 CFR § 1.97(b)

Sir/Madam:

In accordance with applicant's duty to disclose information that may be material to the examination of this application, 37 CFR § 1.56, attached hereto is an Information Disclosure Statement.

The submission of any document herewith is not intended as an admission that such document constitutes prior art against the claims of the present application. Applicant does not waive any rights to take any action that would be appropriate to antedate or otherwise remove as a competent reference any document that is determined to be a prima facie prior art reference against the claims of the present application.

Applicant respectfully requests that the attached Information Disclosure Statement and references be considered by the Examiner and be made of record in the present

application and that a copy of the initialed, signed, and dated e-IDS form be returned in accordance with MPEP §609.07.

It is believed that no additional fee is due for submitting this response. However, in the event a fee is required, the Commissioner is authorized to charge any amounts due or credit any overpayments in connection with this matter to Deposit Account No. 10-0440.

Date: June 24, 2020

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CUSTOMER NUMBER
24574

Electronic Acknowledgement Receipt

EFS ID:	39751671
Application Number:	16869402
International Application Number:	
Confirmation Number:	4812
Title of Invention:	PERCUSSIVE THERAPY DEVICE
First Named Inventor/Applicant Name:	Jason Wersland
Customer Number:	24574
Filer:	Brennan C. Swain/Susan Papp
Filer Authorized By:	Brennan C. Swain
Attorney Docket Number:	76840-5077
Receipt Date:	17-JUN-2020
Filing Date:	07-MAY-2020
Time Stamp:	18:25:11
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Preliminary Amendment	76840_5077_Second_Prelim_Amendment.pdf	113483 64fb8d566984837a951e85403c0167f16bf6ba33	no	7

Warnings:

Information:	
Total Files Size (in bytes):	113483

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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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of: Jason WERSLAND Serial No.: 16/869,402 Filed: May 7, 2020 For: PERCUSSIVE THERAPY DEVICE	Art Unit: 3785 Examiner: not yet assigned Customer No.: 24,574 Docket No.: 76840-5077 Confirmation No.: 4812

PRELIMINARY AMENDMENT

Please amend the above-identified application, without prejudice, as follows:

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

Remarks/Arguments begin on page 5 of this paper.

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

What is claimed is:

1. (original) A percussive therapy device comprising:

a housing,

an electrical source,

a motor positioned in the housing,

a switch for activating the motor, and

a push rod assembly operatively connected to the motor and configured to reciprocate in response to activation of the motor.

2. (currently amended) The percussive therapy device of claim wherein the housing includes first, second and third handle portions and a head portion that cooperate to define a handle opening, wherein the first handle portion defines a first axis, the second handle portion defines a second axis and the third handle portion defines a third axis, wherein the first, second and third axes cooperate to form a triangle, such that a user can grasp any of the first, second or third handle portions independently to use the percussive therapy device, wherein the motor is positioned in the head portion of the housing, and wherein at least a portion of the push rod assembly extends outside of the head portion.

3. (original) The percussive therapy device of claim 2 wherein the first handle portion is generally straight, wherein the second handle portion is generally straight, and wherein the third handle portion is generally straight.

4. (original) The percussive therapy device of claim 1 further comprising a wireless connection device.

5. (original) The percussive therapy device of claim 1 wherein the electrical source is a rechargeable battery, and wherein the percussive massage device further comprising a wireless charging receiver that is in electrical communication with the battery.

6. (original) The percussive therapy device of claim 1 further comprising a touchscreen.

7. (original) The percussive therapy device of claim 1 wherein the motor is a brushless motor, wherein a motor mount is positioned in the housing, wherein the motor is secured to the motor mount, and wherein the motor mount is secured to the housing.

8. (original) The percussive therapy device of claim 7 wherein the motor mount includes first and second side walls that define a motor mount interior therebetween, wherein the motor is secured to the first side wall and wherein the second side wall is secured to the housing.

9. (original) The percussive therapy device of claim 8 wherein the motor includes a motor shaft that extends through a protrusion opening defined in the first side wall of the motor mount and into the motor mount interior, and wherein at least a portion of the push rod assembly is positioned in the motor mount interior.

10-16. canceled

17. (original) The percussive therapy device of claim 2 wherein the electrical source is a battery that is positioned in the second handle portion, and wherein a wireless charging receiver that is in electrical communication with the battery is positioned in the third handle portion.

18. (previously presented) The percussive therapy device of claim 9 wherein the push rod assembly extends through a push rod opening defined in the motor mount and out of the motor mount interior.

19. (previously presented) The percussive therapy device of claim 8 wherein the first side wall includes at least a first flange extending outwardly therefrom, wherein the first flange is positioned adjacent a first protrusion on the motor.

20. (previously presented) The percussive therapy device of claim 19 wherein the first side wall includes second and third flanges extending outwardly therefrom, wherein the second and third flanges are positioned adjacent second and third protrusions on the motor.

21. (previously presented) The percussive therapy device of claim 1 further comprising haptic feedback.

22. (new) The percussive therapy device of claim 2 wherein the first handle portion includes a first handle portion interior edge and defines a first handle portion length, wherein the first handle portion length is long enough that when a user grasps the first handle portion with a hand at least a portion of three fingers extend through the handle opening and contact the first handle portion interior edge, wherein the second handle portion includes a second handle portion interior edge and defines a second handle portion length, wherein the second handle portion length is long enough that when a user grasps the second handle portion with a hand at least a portion of three fingers extend through the handle opening and contact the second handle portion interior edge, wherein the third handle portion includes a third handle portion interior edge and

defines a third handle portion length, wherein the third handle portion length is long enough that when a user grasps the third handle portion with a hand at least a portion of three fingers extend through the handle opening and contact the third handle portion interior edge.

23. (new) The percussive therapy device of claim 22 wherein at least two of the first handle portion, second handle portion and third handle portion are generally straight.

24. (new) A method of using a percussive massage device, the method comprising the steps of:

obtaining the percussive massage device, wherein the percussive massage device includes a housing that includes first, second and third handle portions that cooperate to define a handle opening, an electrical source, a motor positioned in the housing, a switch for activating the motor, and a push rod assembly operatively connected to the motor and configured to reciprocate in response to activation of the motor, wherein the first handle portion defines a first axis, the second handle portion defines a second axis and the third handle portion defines a third axis,

activating the motor using the switch,

grasping the first handle portion,

massaging a first body part,

grasping the second handle portion and massaging the first body part, and

grasping the third handle portion and massaging the first body part.

25. (new) The method of claim 24 wherein the first handle portion includes a first handle portion interior edge and defines a first handle portion length, wherein the first handle portion length is long enough that when a user grasps the first handle portion with a hand at least a portion of three fingers extend through the handle opening and contact the first handle portion interior edge, wherein the second handle portion includes a second handle portion interior edge and defines a second handle portion length, wherein the second handle portion length is long enough that when a user grasps the second handle portion with a hand at least a portion of three fingers extend through the handle opening and contact the second handle portion interior edge,

wherein the third handle portion includes a third handle portion interior edge and defines a third handle portion length, wherein the third handle portion length is long enough that when a user grasps the third handle portion with a hand at least a portion of three fingers extend through the handle opening and contact the third handle portion interior edge.

26. (new) The method of claim 25 wherein the housing includes a head portion, and wherein the motor is positioned in the head portion.

27. (new) The method of claim 26 wherein at least two of the first handle portion, second handle portion and third handle portion are generally straight.

REMARKS

In this preliminary amendment, claim 2 has been amended, no claims have been canceled and claims 22-27 have been added. Accordingly, claims 1-9 and 17-27 remain pending. No new matter has been added.

CONCLUSION

In view of the foregoing, it is believed that all claims now pending patentably define the subject invention over the prior art of record and are in condition for allowance and such action is earnestly solicited at the earliest possible date.

It is believed that no additional fee is due for submitting this response. However, in the event a fee is required, the Commissioner is authorized to charge any amounts due or credit any overpayments in connection with this matter to Deposit Account No. 10-0440.

Respectfully submitted,

JEFFER MANGELS BUTLER & MITCHELL LLP

Dated: June 17, 2020

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Approved for use through 1/31/2014. OMB 0651-0032
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 16/869,402	Filing Date 05/07/2020	☐ 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 $230 =	
☐ 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

AMENDMENT	06/17/2020	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0		x $50 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 3	= 0		x $230 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) 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.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/TARA A WASHINGTON/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. 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 12 minutes 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.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

To: patentdocket@jmbm.com,,
From: PAIR_eOfficeAction@uspto.gov
Cc: PAIR_eOfficeAction@uspto.gov
Subject: Private PAIR Correspondence Notification for Customer Number 24574

Jun 03, 2020 06:11:33 AM

Dear PAIR Customer:

JEFFER, MANGELS, BUTLER & MITCHELL, LLP
1900 AVENUE OF THE STARS, 7TH FLOOR
LOS ANGELES, CA 90067
UNITED STATES

The following USPTO patent application(s) associated with your Customer Number, 24574 , have new outgoing correspondence. This correspondence is now available for viewing in Private PAIR.

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Application	Document	Mailroom Date	Attorney Docket No.
16869402	N570	06/03/2020	76840-5077

To view your correspondence online or update your email addresses, please visit us anytime at https://sportal.uspto.gov/secure/myportal/privatepair.

If you have any questions, please email the Electronic Business Center (EBC) at EBC@uspto.gov with 'e-Office Action' on the subject line or call 1-866-217-9197 during the following hours:

Monday - Friday 6:00 a.m. to 12:00 a.m.

Thank you for prompt attention to this notice,

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PATENT APPLICATION INFORMATION RETRIEVAL SYSTEM

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P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/869,402	05/07/2020	Jason Wersland	76840-5077

CONFIRMATION NO. 4812

24574
JEFFER, MANGELS, BUTLER & MITCHELL, LLP
1900 AVENUE OF THE STARS, 7TH FLOOR
LOS ANGELES, CA 90067

POA ACCEPTANCE LETTER

OC000000117353064

Date Mailed: 06/03/2020

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 05/28/2020.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/kpowell/

To: patentdocket@jmbm.com,,
From: PAIR_eOfficeAction@uspto.gov
Cc: PAIR_eOfficeAction@uspto.gov
Subject: Private PAIR Correspondence Notification for Customer Number 24574

May 28, 2020 04:00:36 AM

Dear PAIR Customer:

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1900 AVENUE OF THE STARS, 7TH FLOOR
LOS ANGELES, CA 90067
UNITED STATES

The following USPTO patent application(s) associated with your Customer Number, 24574 , have new outgoing correspondence. This correspondence is now available for viewing in Private PAIR.

The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

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Application	Document	Mailroom Date	Attorney Docket No.
16869402	TRACK1.GRANT	05/27/2020	76840-5077

To view your correspondence online or update your email addresses, please visit us anytime at https://sportal.uspto.gov/secure/myportal/privatepair.

If you have any questions, please email the Electronic Business Center (EBC) at EBC@uspto.gov with 'e-Office Action' on the subject line or call 1-866-217-9197 during the following hours:

Monday - Friday 6:00 a.m. to 12:00 a.m.

Thank you for prompt attention to this notice,

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION INFORMATION RETRIEVAL SYSTEM

PTO/AIA/80 (02-17)
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POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:

[X] Practitioners associated with Customer Number: 24574

OR

[ ] Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

As attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:

[X] The address associated with Customer Number: 24574

OR

[ ] Firm or Individual name

Address

City | State | Zip

Country

Telephone | Email

Assignee name and address: Theragun, Inc.
9420 Wilshire Blvd., Fourth Floor
Beverly Hills, California 90212

A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of the practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee.

Signature	Date 11-22-19
Name Benjamin Nazarian	Telephone 310-310-0667
Title Chief Executive Officer	

This collection of information is required by 37 CFR 1.31, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public, which is to update (and by the USPTO to process) the file of a patent or reexamination proceeding. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 18 minutes 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.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt

EFS ID:	39563995
Application Number:	16869402
International Application Number:	
Confirmation Number:	4812
Title of Invention:	PERCUSSIVE THERAPY DEVICE
First Named Inventor/Applicant Name:	Jason Wersland
Customer Number:	24574
Filer:	Brennan C. Swain/Sharon Duncan
Filer Authorized By:	Brennan C. Swain
Attorney Docket Number:	76840-5077
Receipt Date:	28-MAY-2020
Filing Date:	07-MAY-2020
Time Stamp:	15:15:58
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Assignee showing of ownership per 37 CFR 3.73	76840_5077_Statement373c.pdf	169189 e1a4d1476e04acd7db184005df5263892800e3e9	no	3

Warnings:

Information:					
2	Power of Attorney	General_Power_of_Attorney_Inc_BH.pdf	246388 18d6f1f79dc3c7271cd61cda4748c5f727fe6a55	no	1
Warnings:					
Information:					
			Total Files Size (in bytes):	415577	

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/AIA/96 (08-12)
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STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: Theragun, Inc.

Application No./Patent No.: 16/869,402 Filed/Issue Date: May 22, 2020

Titled: PERCUSSIVE THERAPY DEVICE

Theragun, Inc., a corporation

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☑ The assignee of the entire right, title, and interest.

2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):

☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.

☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (*e.g.*, bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

A. ☑ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 052736, Frame 0939, or for which a copy thereof is attached.

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

This collection of information is required by 37 CFR 3.73(b). 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 1.11 and 1.14. This collection is estimated to take 12 minutes 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.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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STATEMENT UNDER 37 CFR 3.73(c)

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

4. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

5. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☐ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/brennan c. swain/	May 28, 2020
Signature	Date
Brennan C. Swain	43175
Printed or Typed Name	Title or Registration Number

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 disclosure of these records is required by the Freedom of Information Act.
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 inspection 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.

PTO/AIA/01 (06-12)
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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	PERCUSSIVE THERAPY DEVICE WITH ACTIVE CONTROL

As the below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or

☒ United States application or PCT international application number 16/869,402 filed on May 7, 2020.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Jason Wersland Date (Optional): May 26, 2020

Signature: Jason Wersland

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. 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 1.11 and 1.14. This collection is estimated to take 1 minute 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.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

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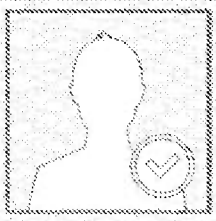
The information provided by you in this form will be subject to the following routine uses:

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 disclosure of these records is required by the Freedom of Information Act.
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.
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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.
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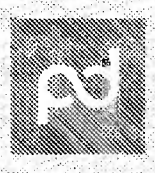


Jason Wersland

Verified E-mail:
drjason@theragun.com

/Jason Wersland/

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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	PERCUSSIVE THERAPY DEVICE

As the below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or

☒ United States application or PCT international application number 16/869,402 filed on May 7, 2020.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

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LEGAL NAME OF INVENTOR

Inventor: Benjamin Nazarian Date (Optional): May 19, 2020

Signature: /Benjamin Nazarian/

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

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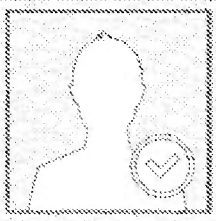
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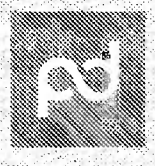
Benjamin Nazarian

Verified E-mail:
ben@theragun.com

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LEGAL NAME OF INVENTOR

Inventor: Jaime Sanchez Solana Date (Optional): 05/19/2020

Signature: Jaime Sanchez

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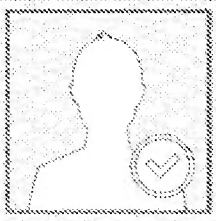
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Signature Certificate

Document Ref.: RBARY-TBCOM-AQFYT-MTNXW

Document signed by:



Jaime Sanchez

Verified E-mail:
jaime@theragun.com



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LEGAL NAME OF INVENTOR

Inventor: Eduardo Merino Date (Optional): 05.19.2020

Signature: /Eduardo Merino/

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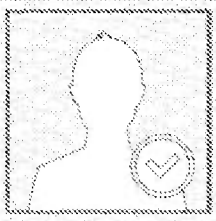
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Document signed by:



Eduardo Merino

Verified E-mail:
eduardo.merino@theragun.com

/Eduardo Merino/

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Electronic Patent Application Fee Transmittal

Application Number:	16869402
Filing Date:	07-May-2020
Title of Invention:	PERCUSSIVE THERAPY DEVICE
First Named Inventor/Applicant Name:	Jason Wersland
Filer:	Brennan C. Swain/Sharon Duncan
Attorney Docket Number:	76840-5077

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:				
Miscellaneous-Filing:				
LATE FILING FEE FOR OATH OR DECLARATION	2051	1	80	80
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**80**

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EFS ID:	39554323
Application Number:	16869402
International Application Number:	
Confirmation Number:	4812
Title of Invention:	PERCUSSIVE THERAPY DEVICE
First Named Inventor/Applicant Name:	Jason Wersland
Customer Number:	24574
Filer:	Brennan C. Swain/Sharon Duncan
Filer Authorized By:	Brennan C. Swain
Attorney Docket Number:	76840-5077
Receipt Date:	27-MAY-2020
Filing Date:	07-MAY-2020
Time Stamp:	17:45:27
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Oath or Declaration filed	76840_5077_Declaration_Wersland.pdf	922907 2f6e80d8d49eefcc63010f7d3d1afb28af23e823	no	3

Warnings:

Information:					
2	Oath or Declaration filed	76840_5077_Declaration_Nazarian.pdf	913887 263b7a7f6d7e3d268ff01fb61d4d26efcaf61765	no	3
Warnings:					
Information:					
3	Oath or Declaration filed	76840_5077_Declaration_Sanchez.pdf	906936 858a2002bc73a94d548dc0101871eb40e289e2d4	no	3
Warnings:					
Information:					
4	Oath or Declaration filed	76840_5077_Declaration_Merino.pdf	917749 82f8e89a29929f3f3d0c99ef75c36a4b6cc1cc7f	no	3
Warnings:					
Information:					
5	Fee Worksheet (SB06)	fee-info.pdf	30607 01e0a279fd85b506874ae42f35bb203977181e4c	no	2
Warnings:					
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<u>National Stage of an International Application under 35 U.S.C. 371</u>
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/869,402	05/07/2020	Jason Wersland	76840-5077	4812

24574 7590 05/27/2020

JEFFER, MANGELS, BUTLER & MITCHELL, LLP
1900 AVENUE OF THE STARS, 7TH FLOOR
LOS ANGELES, CA 90067

EXAMINER	

ART UNIT	PAPER NUMBER
3785	

NOTIFICATION DATE	DELIVERY MODE
05/27/2020	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):

patentdocket@jmbm.com

Decision Granting Request for Prioritized Examination (Track I)	**Application No.** 16/869,402	**Applicant(s)** Wersland et al.	
	Examiner TERRI S JOHNSON	**Art Unit** OPET	**AIA (FITF) Status** Yes

1. THE REQUEST FILED 07 May 2020 IS **GRANTED** .

The above-identified application has met the requirements for prioritized examination

A. ☑ for an original nonprovisional application (Track I).
B. ☐ for an application undergoing continued examination (RCE).

2. **The above-identified application will undergo prioritized examination**. The application will be accorded special status throughout its entire course of prosecution until one of the following occurs:

A. filing a **petition for extension of time** to extend the time period for filing a reply;

B. filing an **amendment to amend the application to contain more than four independent claims, more than thirty total claims** , or a multiple dependent claim;

C. filing a **request for continued examination** ;

D. filing a notice of appeal;

E. filing a request for suspension of action;

F. mailing of a notice of allowance;

G. mailing of a final Office action;

H. completion of examination as defined in 37 CFR 41.102; or

I. abandonment of the application.

Telephone inquiries with regard to this decision should be directed to TERRI JOHNSON at (571)272 -2991. In his/her absence, calls may be directed to Petition Help Desk at (571) 272-3282.

/TERRI S JOHNSON/ Paralegal Specialist, OPET	

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
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 16/869,402	Filing Date 05/07/2020	☐ 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), (l), 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 $230 =	
☐ 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

AMENDMENT	05/20/2020	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 14	Minus	** 20	= 0		x $50 =	0
	Independent (37 CFR 1.16(h))	* 1	Minus	*** 3	= 0		x $230 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) 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.	LDRC
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/EVA V GILLIS/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. 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 12 minutes 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.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt

EFS ID:	39497849
Application Number:	16869402
International Application Number:	
Confirmation Number:	4812
Title of Invention:	PERCUSSIVE THERAPY DEVICE
First Named Inventor/Applicant Name:	Jason Wersland
Customer Number:	24574
Filer:	Brennan C. Swain/Susan Papp
Filer Authorized By:	Brennan C. Swain
Attorney Docket Number:	76840-5077
Receipt Date:	20-MAY-2020
Filing Date:	07-MAY-2020
Time Stamp:	17:19:55
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Preliminary Amendment	76840_5077_Prelim_Amendment.pdf	108897 ed6ac8f6f317d8a6c31d0c0c5fbef59c3f861284	no	5

Warnings:

Information:	
Total Files Size (in bytes):	108897

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of: Jason WERSLAND Serial No.: 16/869,402 Filed: May 7, 2020 For: PERCUSSIVE THERAPY DEVICE	Art Unit: 3785 Examiner: not yet assigned Customer No.: 24,574 Docket No.: 76840-5077 Confirmation No.: 4812

PRELIMINARY AMENDMENT

Please amend the above-identified application, without prejudice, as follows:

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

Remarks/Arguments begin on page 5 of this paper.

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

What is claimed is:

1. (original) A percussive therapy device comprising:

a housing,

an electrical source,

a motor positioned in the housing,

a switch for activating the motor, and

a push rod assembly operatively connected to the motor and configured to reciprocate in response to activation of the motor.

2. (original) The percussive therapy device of claim wherein the housing includes first, second and third handle portions and a head portion that cooperate to define a handle opening, wherein the first handle portion defines a first axis, the second handle portion defines a second axis and the third handle portion defines a third axis, wherein the first, second and third axes cooperate to form a triangle, wherein the motor is positioned in the head portion of the housing, and wherein at least a portion of the push rod assembly extends outside of the head portion.

3. (original) The percussive therapy device of claim 2 wherein the first handle portion is generally straight, wherein the second handle portion is generally straight, and wherein the third handle portion is generally straight.

4. (original) The percussive therapy device of claim 1 further comprising a wireless connection device.

5. (original) The percussive therapy device of claim 1 wherein the electrical source is a rechargeable battery, and wherein the percussive massage device further comprising a wireless charging receiver that is in electrical communication with the battery.

6. (original) The percussive therapy device of claim 1 further comprising a touchscreen.

7. (original) The percussive therapy device of claim 1 wherein the motor is a brushless motor, wherein a motor mount is positioned in the housing, wherein the motor is secured to the motor mount, and wherein the motor mount is secured to the housing.

8. (original) The percussive therapy device of claim 7 wherein the motor mount includes first and second side walls that define a motor mount interior therebetween, wherein the motor is secured to the first side wall and wherein the second side wall is secured to the housing.

9. (original) The percussive therapy device of claim 8 wherein the motor includes a motor shaft that extends through a protrusion opening defined in the first side wall of the motor mount and into the motor mount interior, and wherein at least a portion of the push rod assembly is positioned in the motor mount interior.

10-16. canceled

17. (original) The percussive therapy device of claim 2 wherein the electrical source is a battery that is positioned in the second handle portion, and wherein a wireless charging receiver that is in electrical communication with the battery is positioned in the third handle portion.

18. (new) The percussive therapy device of claim 9 wherein the push rod assembly extends through a push rod opening defined in the motor mount and out of the motor mount interior.

19. (new) The percussive therapy device of claim 8 wherein the first side wall includes at least a first flange extending outwardly therefrom, wherein the first flange is positioned adjacent a first protrusion on the motor.

20. (new) The percussive therapy device of claim 19 wherein the first side wall includes second and third flanges extending outwardly therefrom, wherein the second and third flanges are positioned adjacent second and third protrusions on the motor.

21. (new) The percussive therapy device of claim 1 further comprising haptic feedback.

REMARKS

In this preliminary amendment, no claims have been amended, claims 10-16 have been canceled and claims 18-21 have been added. Accordingly, claims 1-9 and 17-21 remain pending. No new matter has been added.

CONCLUSION

In view of the foregoing, it is believed that all claims now pending patentably define the subject invention over the prior art of record and are in condition for allowance and such action is earnestly solicited at the earliest possible date.

It is believed that no additional fee is due for submitting this response. However, in the event a fee is required, the Commissioner is authorized to charge any amounts due or credit any overpayments in connection with this matter to Deposit Account No. 10-0440.

Respectfully submitted,

JEFFER MANGELS BUTLER & MITCHELL LLP

Dated: May 20, 2020

By: /Brennan C. Swain/

Brennan C. Swain, Esq.
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Seventh Floor
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(310) 203-8080
patentdocket@jmbm.com
CUSTOMER NO. 24,574

To: patentdocket@jmbm.com,,
From: PAIR_eOfficeAction@uspto.gov
Cc: PAIR_eOfficeAction@uspto.gov
Subject: Private PAIR Correspondence Notification for Customer Number 24574

May 13, 2020 09:13:49 AM

Dear PAIR Customer:

JEFFER, MANGELS, BUTLER & MITCHELL, LLP
1900 AVENUE OF THE STARS, 7TH FLOOR
LOS ANGELES, CA 90067
UNITED STATES

The following USPTO patent application(s) associated with your Customer Number, 24574 , have new outgoing correspondence. This correspondence is now available for viewing in Private PAIR.

The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

Disclaimer:
The list of documents shown below is provided as a courtesy and is not part of the official file wrapper. The content of the images shown in PAIR is the official record.

Application	Document	Mailroom Date	Attorney Docket No.
16869402	APP.FILE.REC	05/13/2020	76840-5077
	M327	05/13/2020	76840-5077

To view your correspondence online or update your email addresses, please visit us anytime at https://sportal.uspto.gov/secure/myportal/privatepair.

If you have any questions, please email the Electronic Business Center (EBC) at EBC@uspto.gov with 'e-Office Action' on the subject line or call 1-866-217-9197 during the following hours:

Monday - Friday 6:00 a.m. to 12:00 a.m.

Thank you for prompt attention to this notice,

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PATENT APPLICATION INFORMATION RETRIEVAL SYSTEM

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P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/869,402	05/07/2020	Jason Wersland	76840-5077

CONFIRMATION NO. 4812

24574
JEFFER, MANGELS, BUTLER & MITCHELL, LLP
1900 AVENUE OF THE STARS, 7TH FLOOR
LOS ANGELES, CA 90067

INFORMAL NOTICE

OC000000116958167

Date Mailed: 05/13/2020

INFORMATIONAL NOTICE TO APPLICANT

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

The item(s) indicated below are also required and should be submitted with any reply to this notice to avoid further processing delays.

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):
  Jason Wersland
  Benjamin Nazarian
  Jaime Sanchez Solana
  Eduardo Merino

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/tgebre/

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
16/869,402	05/07/2020	3785	865	76840-5077	17	1

CONFIRMATION NO. 4812

24574
JEFFER, MANGELS, BUTLER & MITCHELL, LLP
1900 AVENUE OF THE STARS, 7TH FLOOR
LOS ANGELES, CA 90067

FILING RECEIPT

OC000000118958166

Date Mailed: 05/13/2020

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections provided that the request is grantable.

Inventor(s)

Jason Wersland, Manhattan Beach, CA;
Benjamin Nazarian, Beverly Hills, CA;
Jaime Sanchez Solana, Los Angeles, CA;
Eduardo Merino, Beverly Hills, CA;

Applicant(s)

Theragun, Inc., Beverly Hills, CA

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CIP of 16/796,143 02/20/2020
which claims benefit of 62/844,424 05/07/2019
and claims benefit of 62/899,098 09/11/2019
and claims benefit of 62/912,392 10/08/2019
This application 16/869,402
is a CIP of 16/675,772 11/06/2019
which claims benefit of 62/785,151 12/26/2018

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 05/12/2020

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 16/869,402**

Projected Publication Date: 08/20/2020

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

PERCUSSIVE THERAPY DEVICE

Preliminary Class

128

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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NOT GRANTED

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 16/869,402

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	75		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	330		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	380		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	17 minus 20 =	*	x 50 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1 minus 3 =	*	x 230 =	0.00			
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).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	785		TOTAL	

APPLICATION AS AMENDED - PART II

AMENDMENT A

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

AMENDMENT B

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

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.



United States Patent and Trademark Office

Office of the Chief Financial Officer

Document Code:WFEE

User :C44171

Sale Accounting Date:05/12/2020

Sale Item Reference Number	Effective Date
16869402	05/07/2020

Document Number	Fee Code	Fee Code Description	Amount Paid	Payment Method
I20205BD48437419	2051	LATE FILING FEE FOR OATH OR DECLARATION	$80.00	Deposit Account

Doc Code: TRACK1.REQ
Document Description: TrackOne Request

PTO/AIA/424 (04-14)

CERTIFICATION AND REQUEST FOR PRIORITIZED EXAMINATION UNDER 37 CFR 1.102(e) (Page 1 of 1)

First Named Inventor:	Jason Wersland	Nonprovisional Application Number (if known):	
Title of Invention:	PERCUSSIVE THERAPY DEVICE		

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS PRIORITIZED EXAMINATION FOR THE ABOVE-IDENTIFIED APPLICATION.

1. The processing fee set forth in 37 CFR 1.17(i)(1) and the prioritized examination fee set forth in 37 CFR 1.17(c) have been filed with the request. The publication fee requirement is met because that fee, set forth in 37 CFR 1.18(d), is currently $0. The basic filing fee, search fee, and examination fee are filed with the request or have been already been paid. I understand that any required excess claims fees or application size fee must be paid for the application.

2. I understand that the application may not contain, or be amended to contain, more than four independent claims, more than thirty total claims, or any multiple dependent claims, and that any request for an extension of time will cause an outstanding Track I request to be dismissed.

3. The applicable box is checked below:

I. ☑ **Original Application (Track One) - Prioritized Examination under § 1.102(e)(1)**

i. (a) The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a). This certification and request is being filed with the utility application via EFS-Web.

---OR---

(b) The application is an original nonprovisional plant application filed under 35 U.S.C. 111(a). This certification and request is being filed with the plant application in paper.

ii. An executed inventor's oath or declaration under 37 CFR 1.63 or 37 CFR 1.64 for each inventor, **or** the application data sheet meeting the conditions specified in 37 CFR 1.53(f)(3)(i) is filed with the application.

II. ☐ **Request for Continued Examination - Prioritized Examination under § 1.102(e)(2)**

i. A request for continued examination has been filed with, or prior to, this form.
ii. If the application is a utility application, this certification and request is being filed via EFS-Web.
iii. The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a), or is a national stage entry under 35 U.S.C. 371.
iv. This certification and request is being filed prior to the mailing of a first Office action responsive to the request for continued examination.
v. No prior request for continued examination has been granted prioritized examination status under 37 CFR 1.102(e)(2).

Signature /Brennan C. Swain/	Date May 7, 2020
Name (Print/Typed) Brennan C. Swain	Practitioner Registration Number 43175

Note: *This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required.**

☑ *Total of 1 forms are submitted.

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 disclosure of these records is required by the Freedom of Information Act.
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 inspection 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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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	76840-5077
	Application Number	
Title of Invention	PERCUSSIVE THERAPY DEVICE	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Jason		Wersland	

Residence Information (Select One) • US Residency Non US Residency Active US Military Service

City	Manhattan Beach	State/Province	CA	Country of Residence	US

Mailing Address of Inventor:

Address 1	9420 Wilshire Blvd., Fourth Floor		
Address 2			
City	Beverly Hills	State/Province	CA
Postal Code	90212	Country i	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Benjamin		Nazarian	

Residence Information (Select One) ◉ US Residency Non US Residency Active US Military Service

City	Beverly Hills	State/Province	CA	Country of Residence	US

Mailing Address of Inventor:

Address 1	9420 Wilshire Blvd., Fourth Floor		
Address 2			
City	Beverly Hills	State/Province	CA
Postal Code	90212	Country i	US

Inventor 3 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Jaime	Sanchez	Solana	

Residence Information (Select One) ◉ US Residency Non US Residency Active US Military Service

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	76840-5077
	Application Number	
Title of Invention	PERCUSSIVE THERAPY DEVICE	

City	Los Angeles	State/Province	CA	Country of Residence	US

Mailing Address of Inventor:

Address 1	9420 Wilshire Blvd., Fourth Floor		
Address 2			
City	Beverly Hills	State/Province	CA
Postal Code	90212	Country	US

Inventor 4 — Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Eduardo		Merino	

Residence Information (Select One) ◉ US Residency Non US Residency Active US Military Service

City	Beverly Hills	State/Province	CA	Country of Residence	US

Mailing Address of Inventor:

Address 1	9420 Wilshire Blvd., Fourth Floor		
Address 2			
City	Beverly Hills	State/Province	CA
Postal Code	90212	Country	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	24574		
Email Address	patentdocket@jmbm.com	Add Email	Remove Email

Application Information:

Title of the Invention	PERCUSSIVE THERAPY DEVICE		
Attorney Docket Number	76840-5077	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	50	Suggested Figure for Publication (if any)	36

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	76840-5077
	Application Number	
Title of Invention	PERCUSSIVE THERAPY DEVICE	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	● Customer Number	US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	24574		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation in part of	16796143	2020-02-20

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	76840-5077
	Application Number	
Title of Invention	PERCUSSIVE THERAPY DEVICE	

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
16796143	Claims benefit of provisional	62844424	2019-05-07
Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
16796143	Claims benefit of provisional	62899098	2019-09-11
Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
16796143	Claims benefit of provisional	62912392	2019-10-08
Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation in part of	16675772	2019-11-06
Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
16675772	Claims benefit of provisional	62785151	2018-12-26
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.			Add

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

			Remove
Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)
Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.			Add

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	76840-5077
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Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	76840-5077
	Application Number	
Title of Invention	PERCUSSIVE THERAPY DEVICE	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	76840-5077
	Application Number	
Title of Invention	PERCUSSIVE THERAPY DEVICE	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1 Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
● Person to whom the inventor is obligated to assign.	Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	Theragun, Inc.		
Mailing Address Information For Applicant:			
Address 1	9420 Wilshire Blvd., Fourth Floor		
Address 2			
City	Beverly Hills	**State/Province**	CA
Country	US	Postal Code	90212
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	76840-5077
	Application Number	
Title of Invention	PERCUSSIVE THERAPY DEVICE	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add

Signature:

Remove

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Brennan C. Swain/			Date (YYYY-MM-DD)	2020-05-07
First Name	Brennan	Last Name	Swain	Registration Number	43175

Additional Signature may be generated within this form by selecting the Add button. Add

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	76840-5077
	Application Number	
Title of Invention	PERCUSSIVE THERAPY DEVICE	

This collection of information is required by 37 CFR 1.76. 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 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet 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.**

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 records.

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 CooperationTreaty.

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.

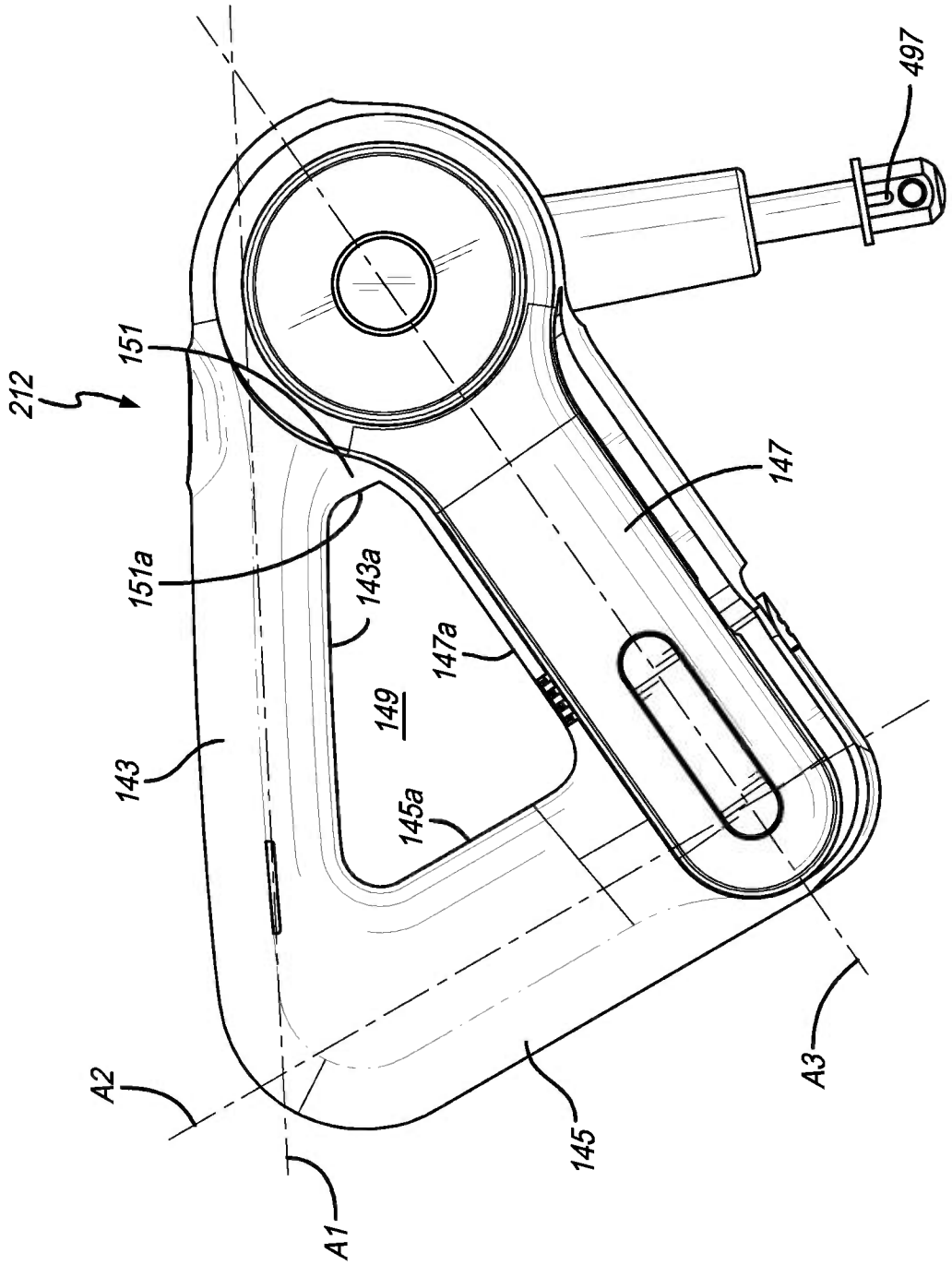


FIG. 1

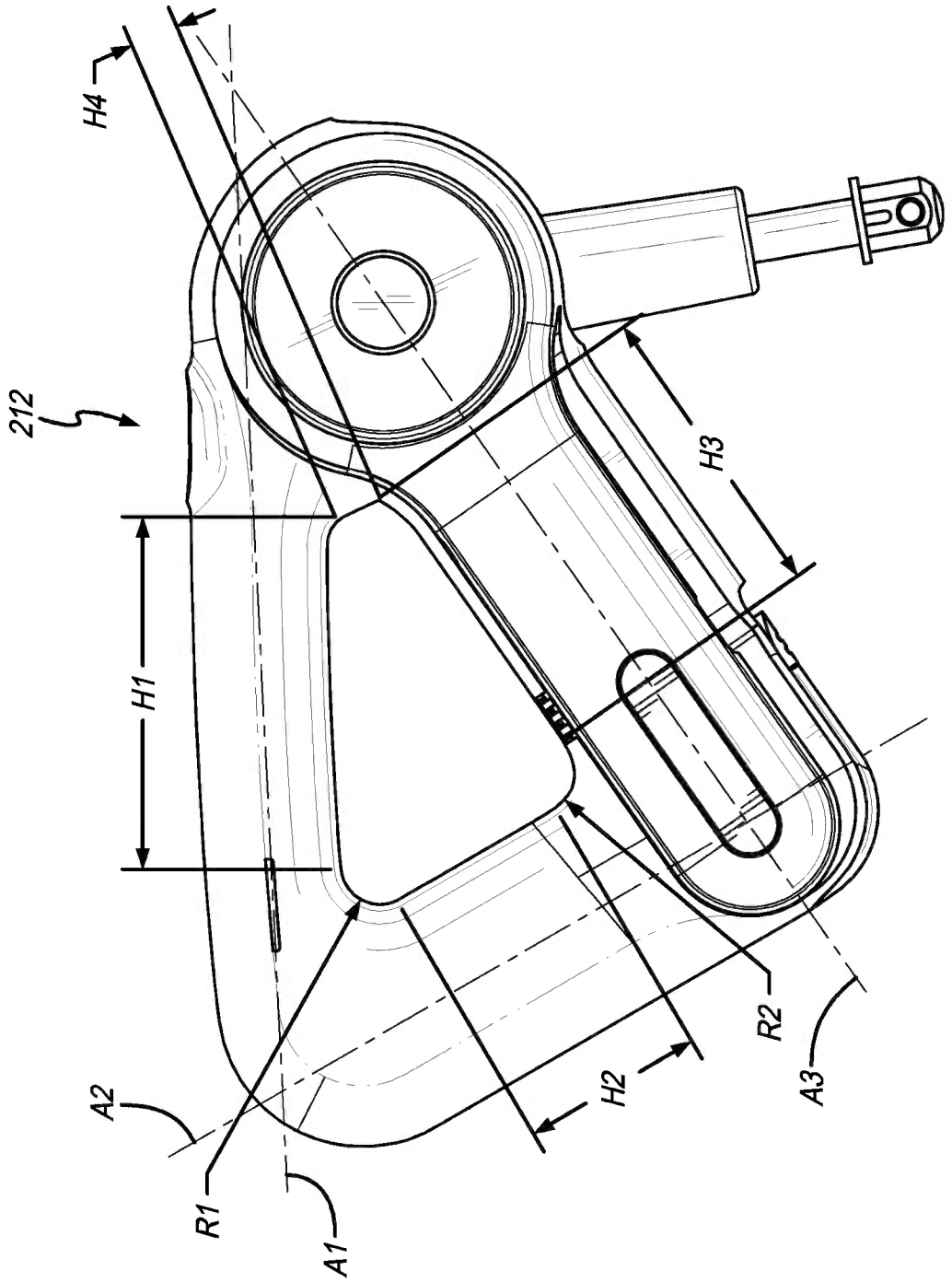


FIG. 1A

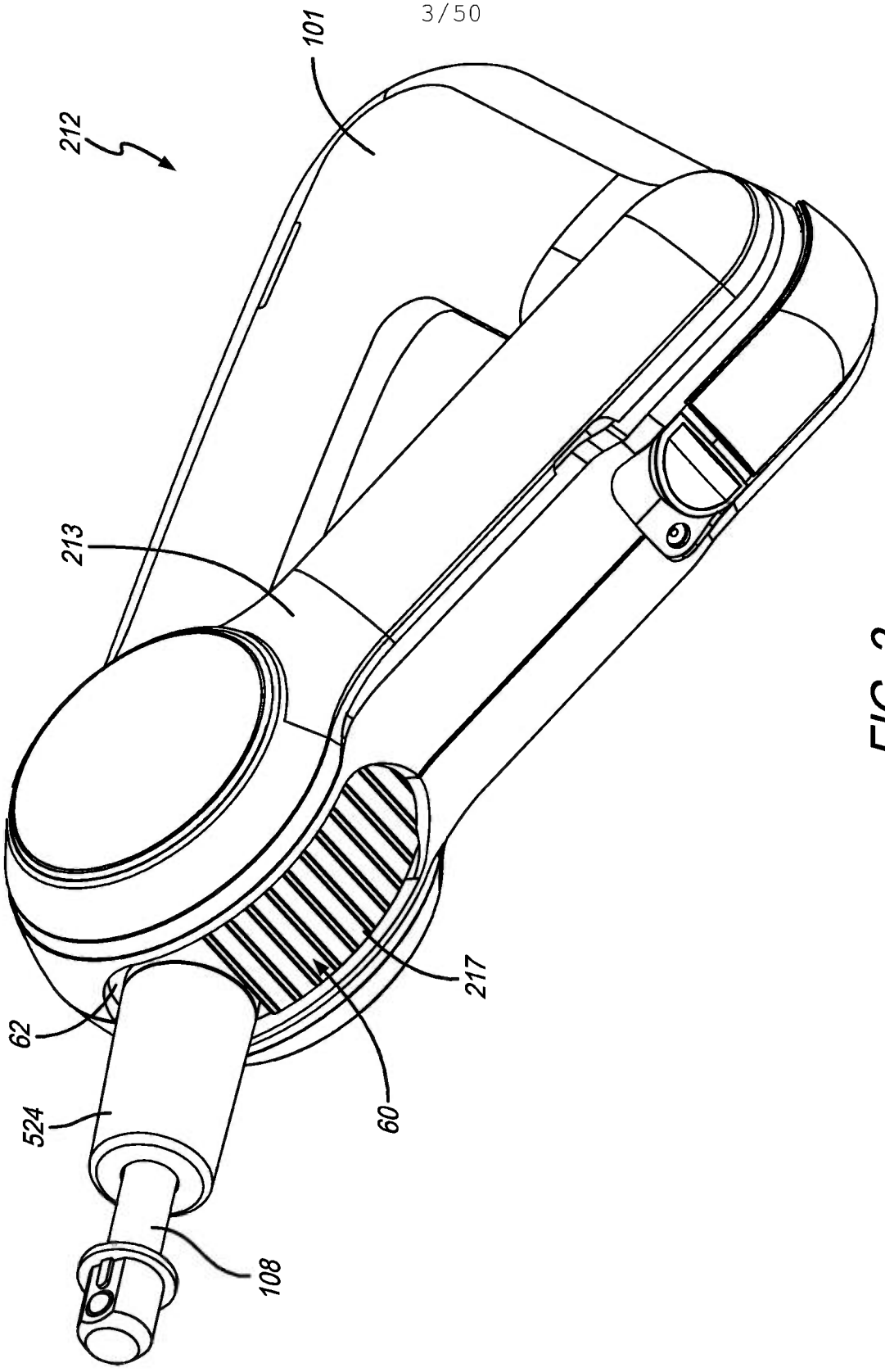


FIG. 2

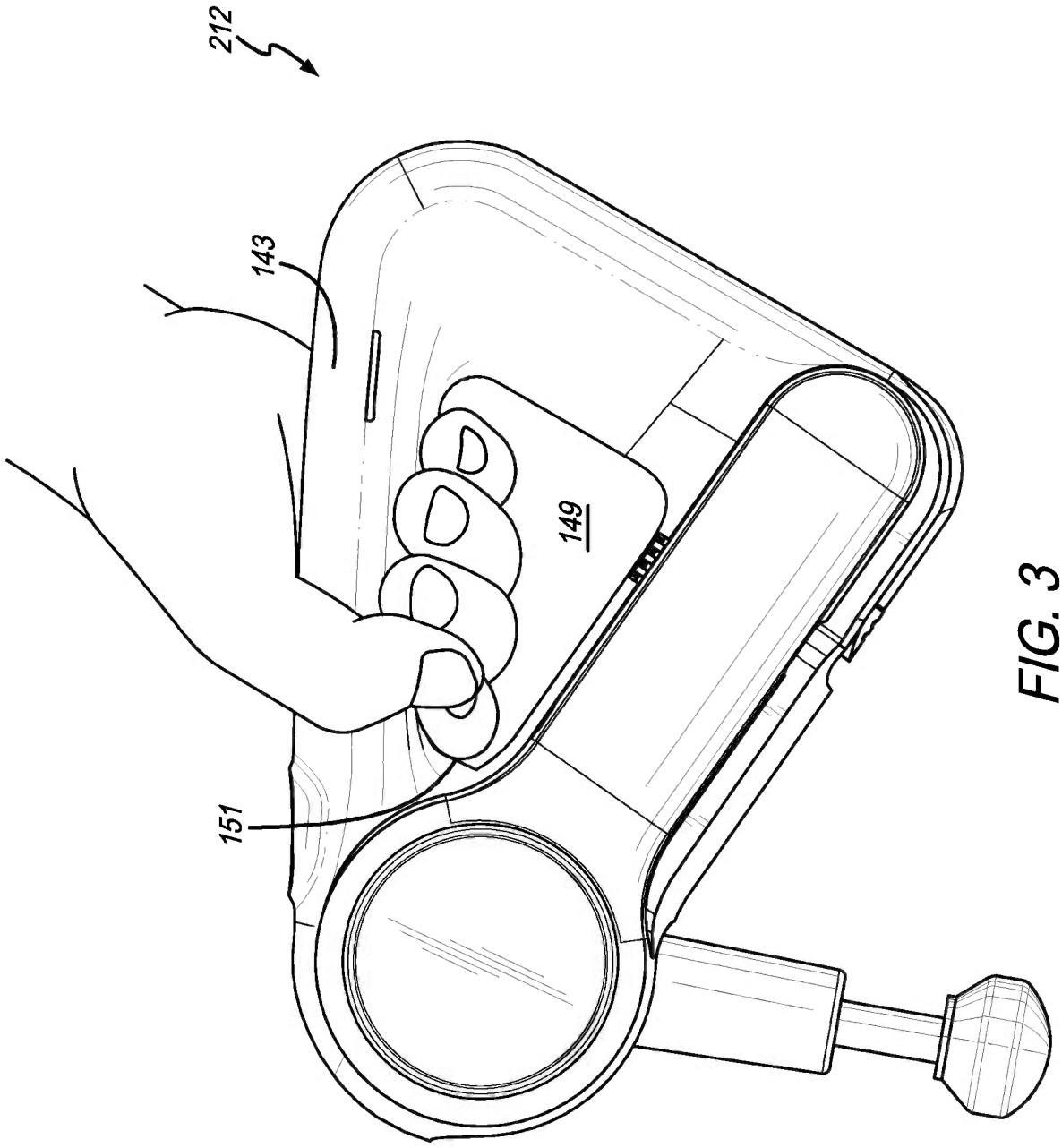


FIG. 3

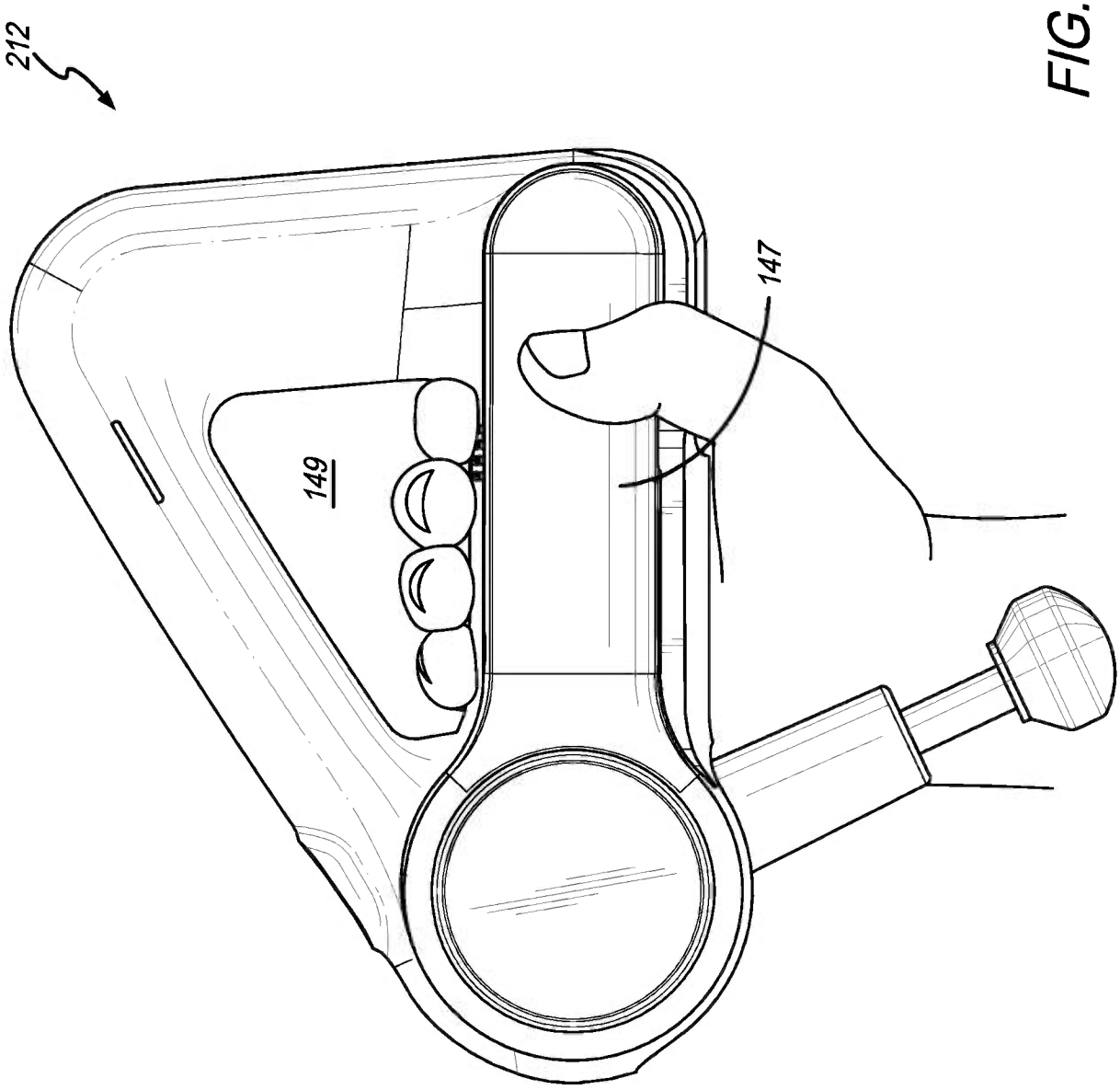


FIG. 4

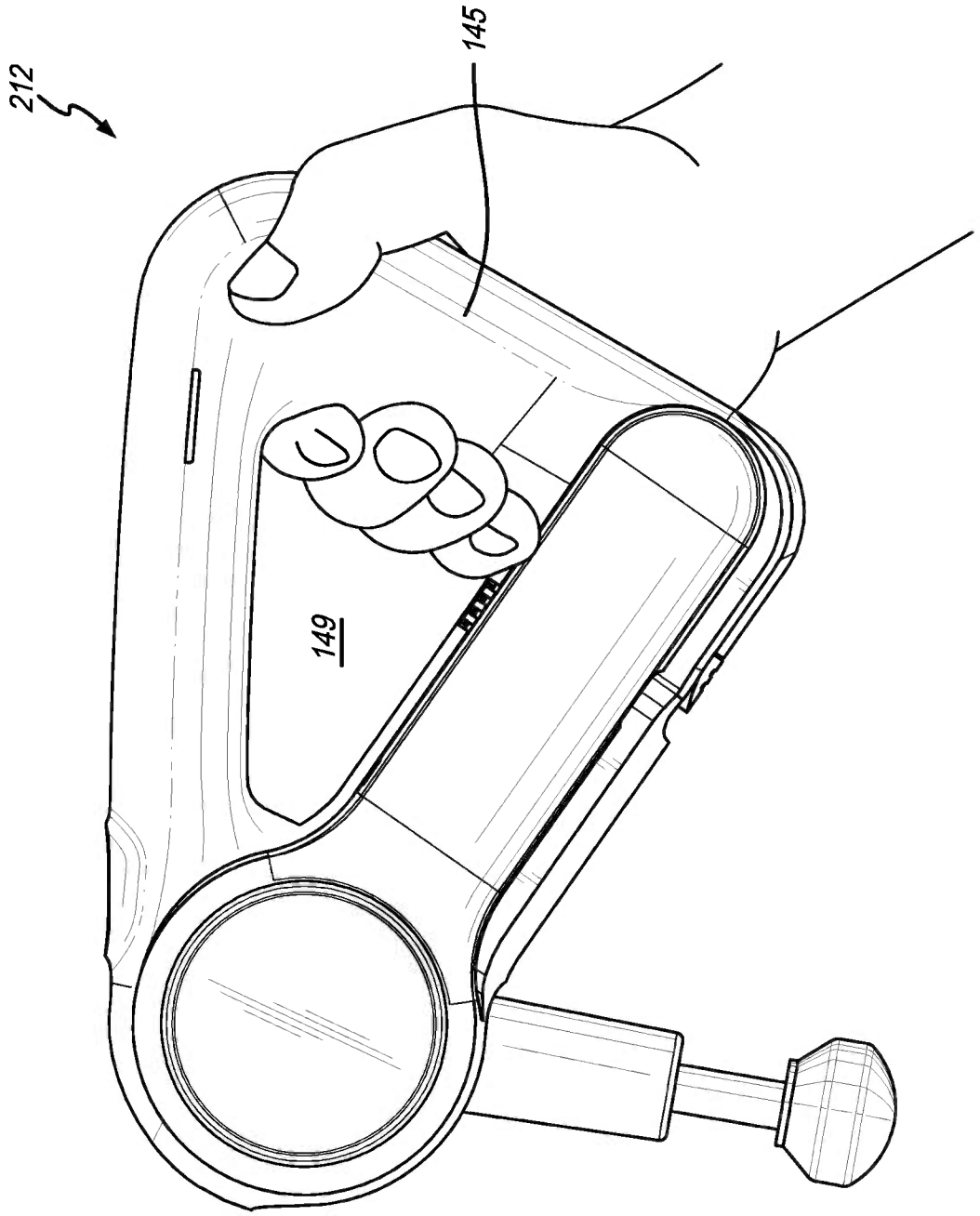


FIG. 5

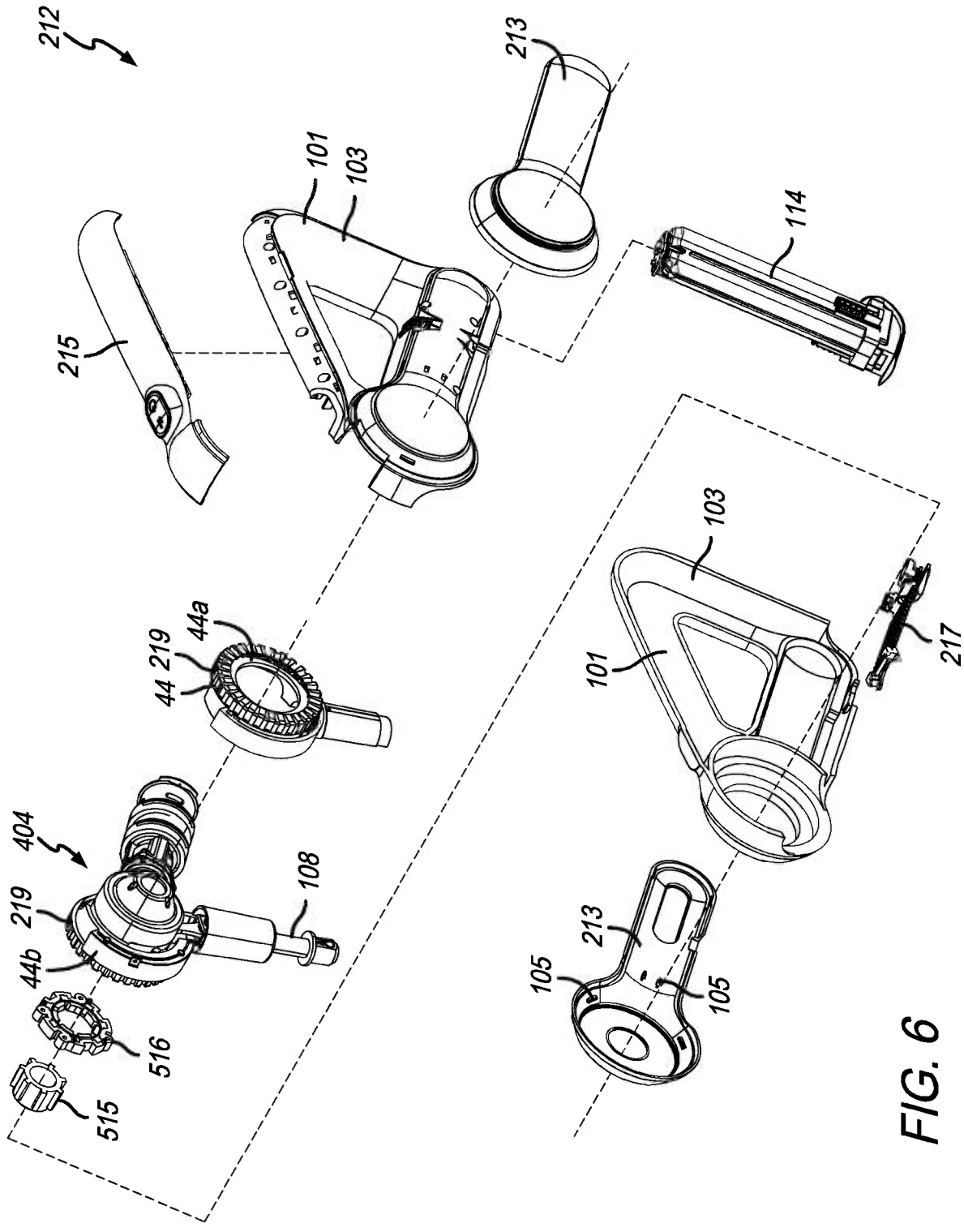

212
213
101
103
114
215
44a
44 219
404
219
108
44b
516
515
103
101
217
213
105
105

FIG. 6

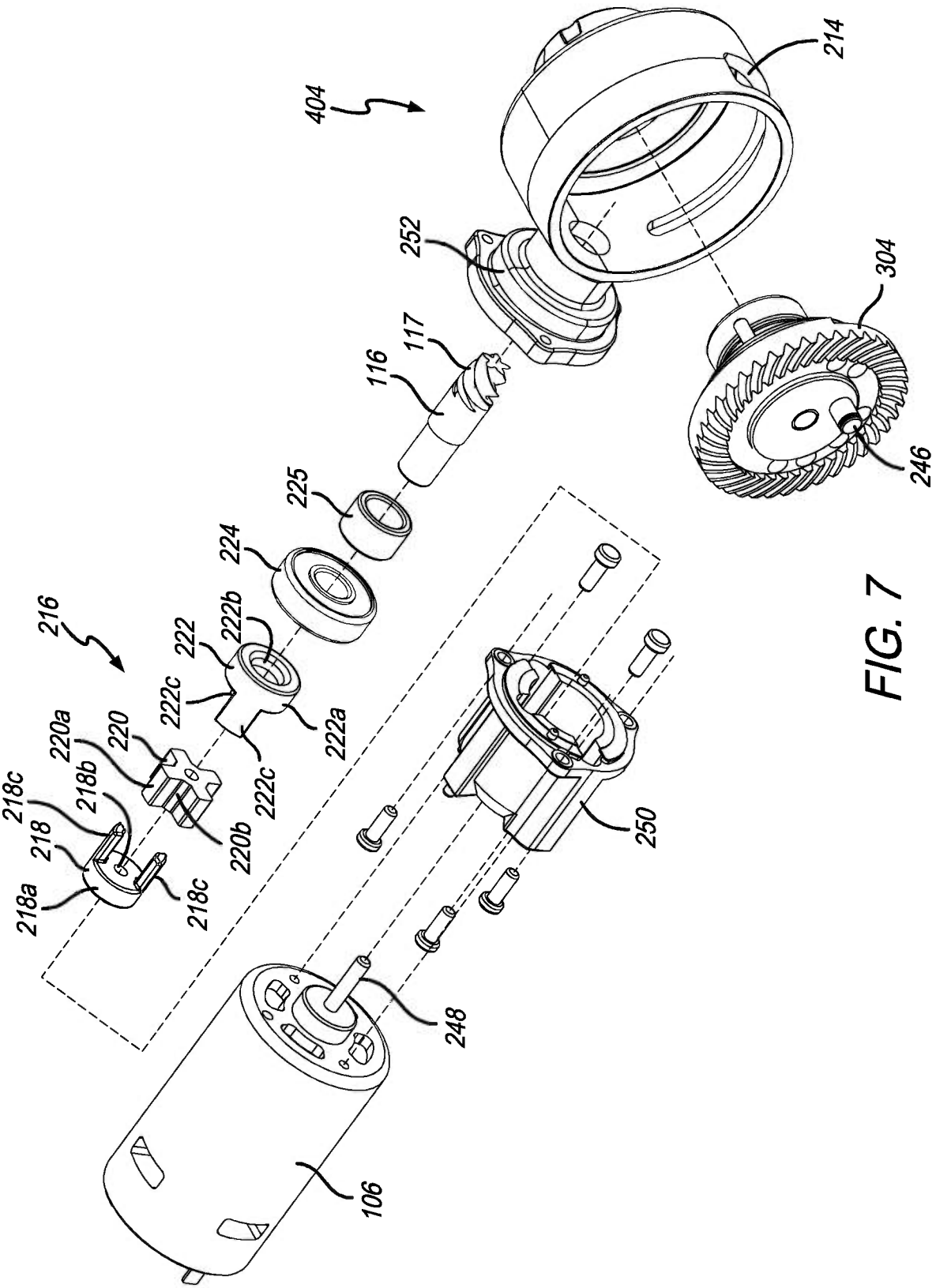

404
214
252
304
116
117
225
224
216
222
222b
222c
220a
220
218c
218b
218
218a
220b
222a
250
248
106
246

FIG. 7

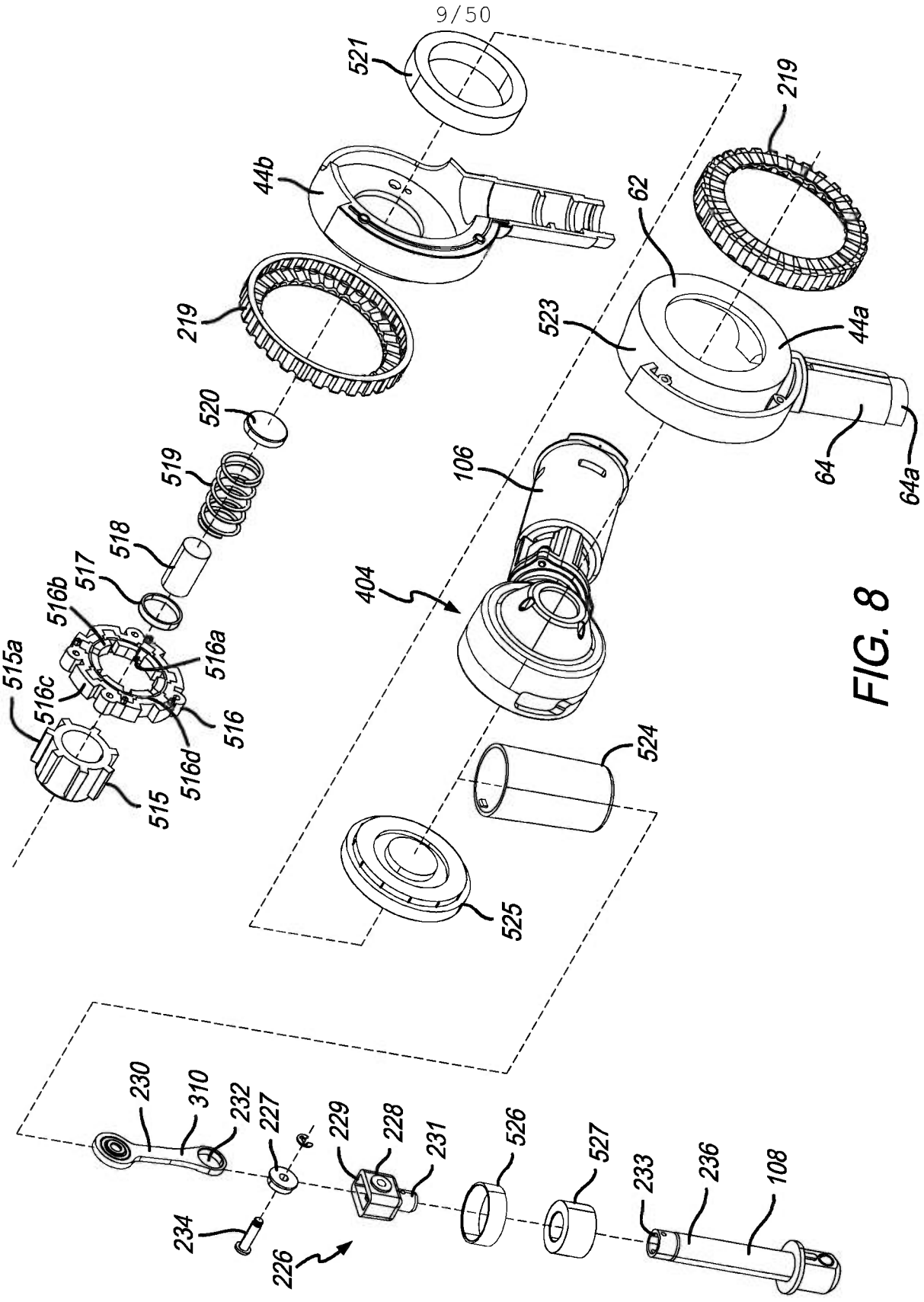

521
44b
219
520
519
518
517
516b
516a
516c
516
516d
515a
515
404
106
524
525
219
62
523
44a
64
64a
230
310
232
227
229
228
231
526
527
233
236
108
234
226

FIG. 8

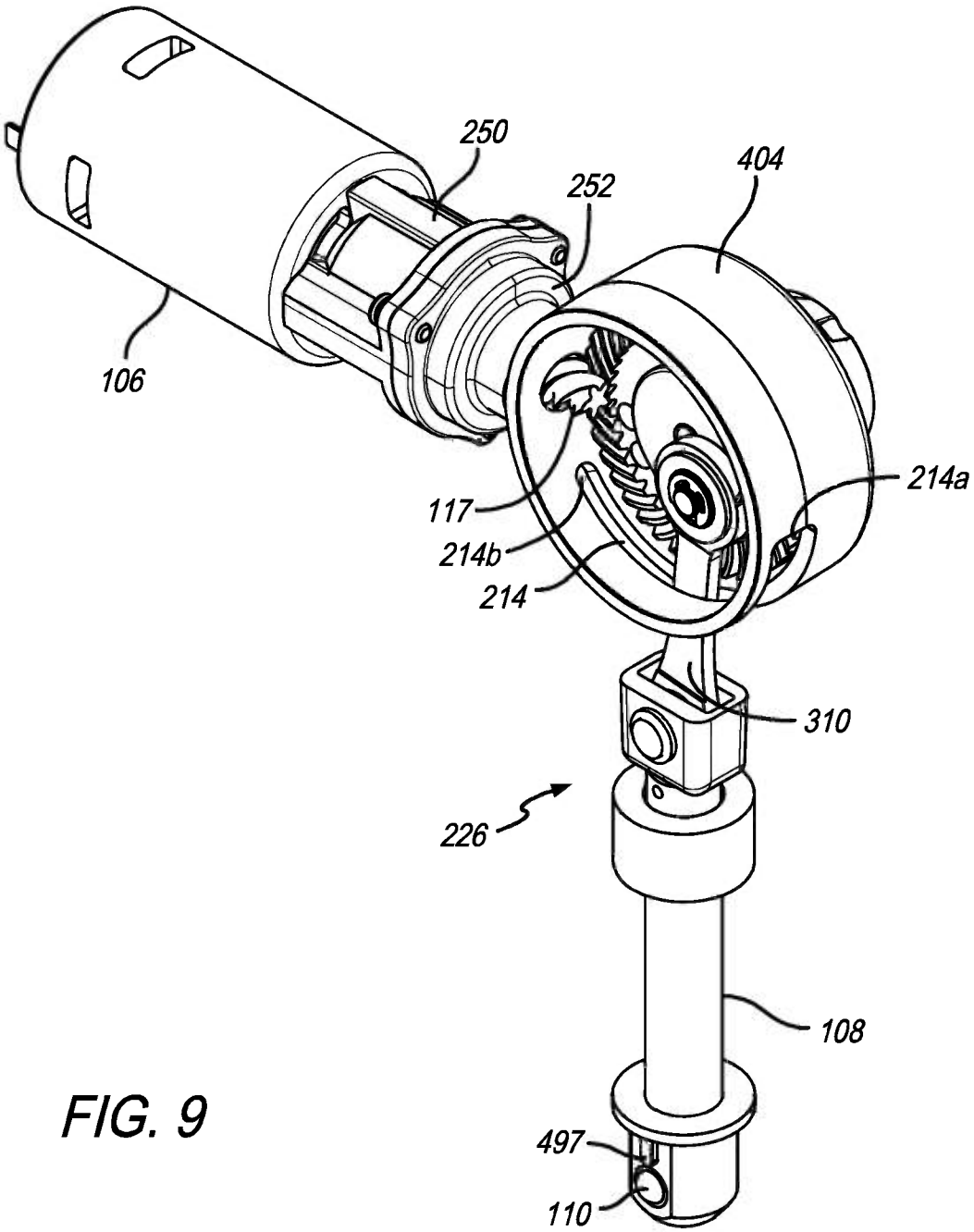


FIG. 9

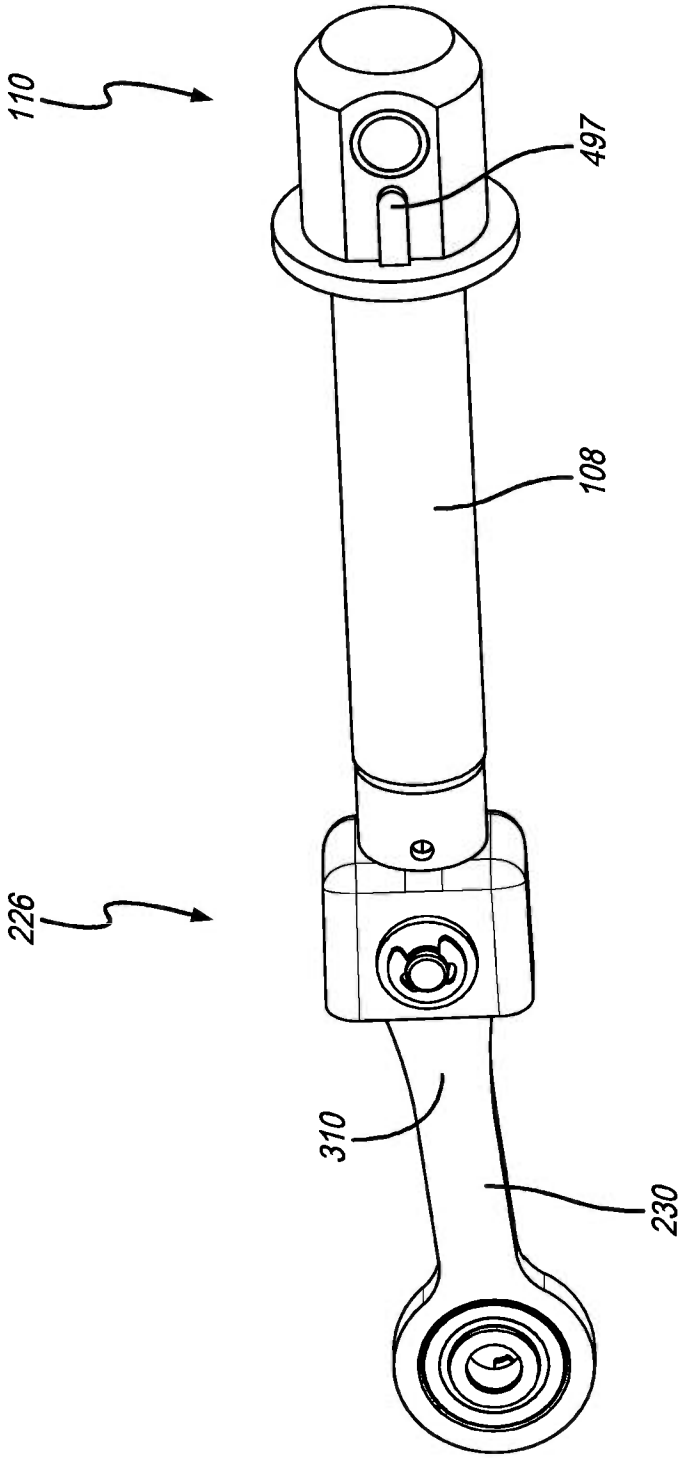


FIG. 10

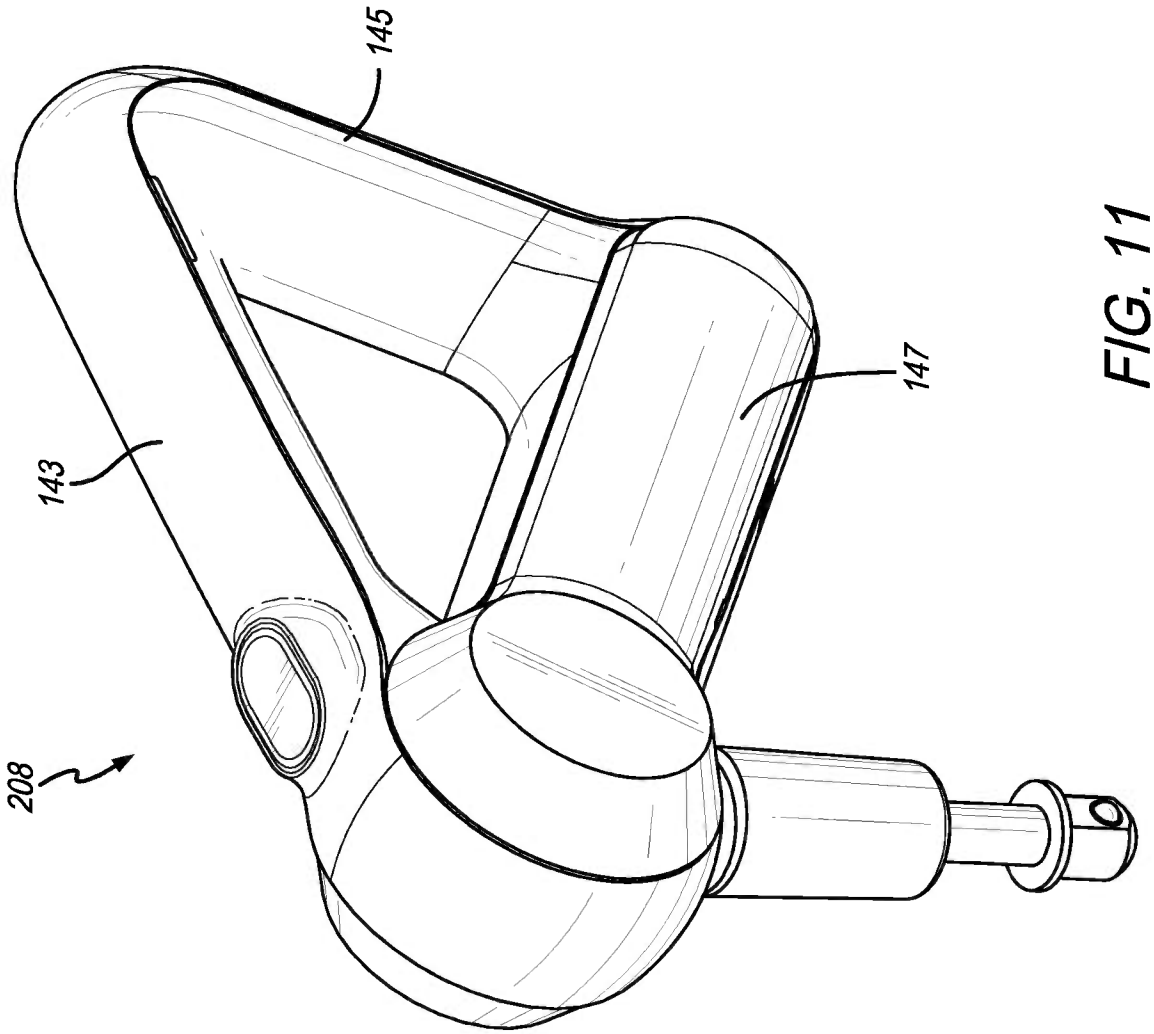


FIG. 11

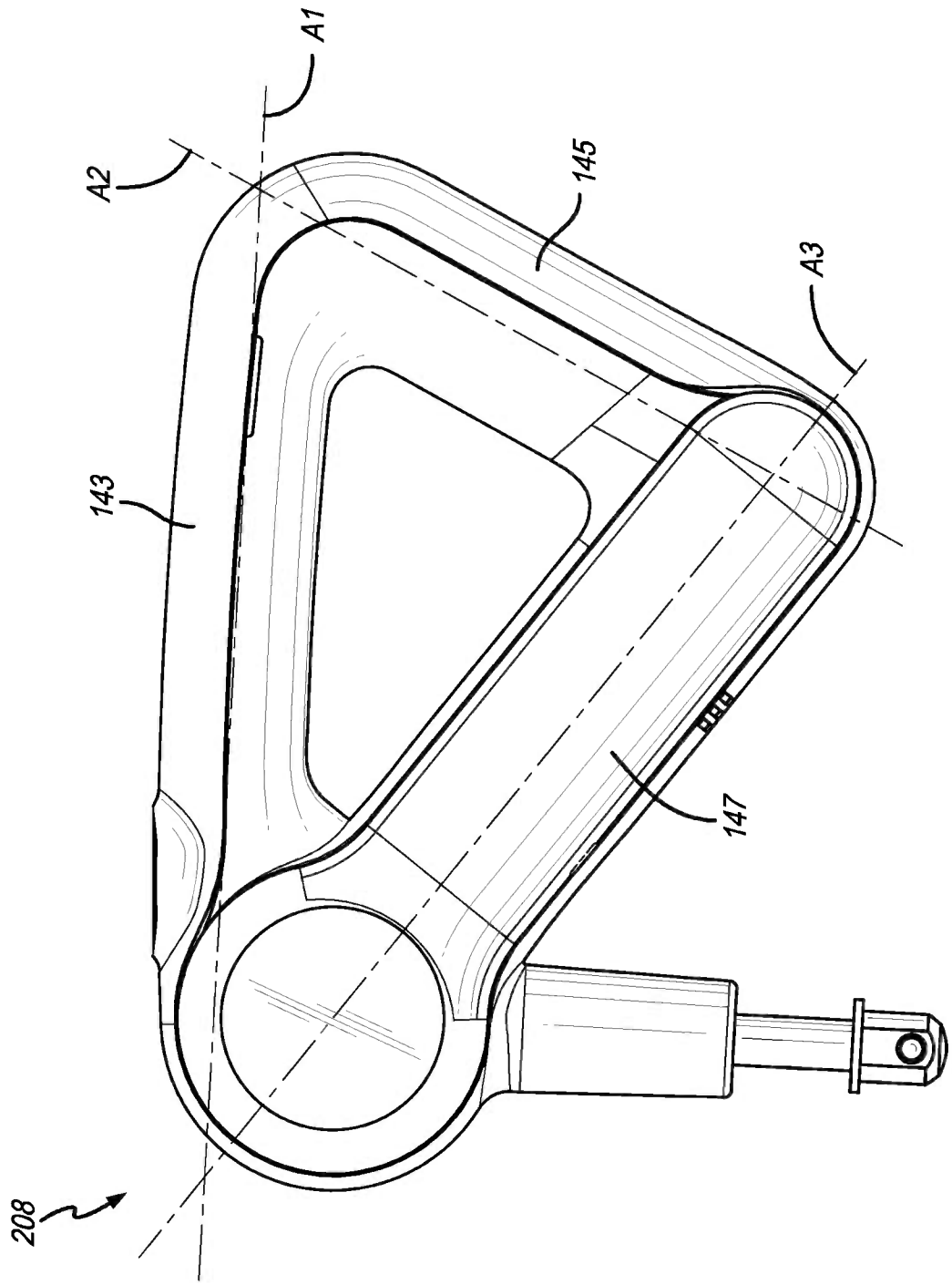


FIG. 12

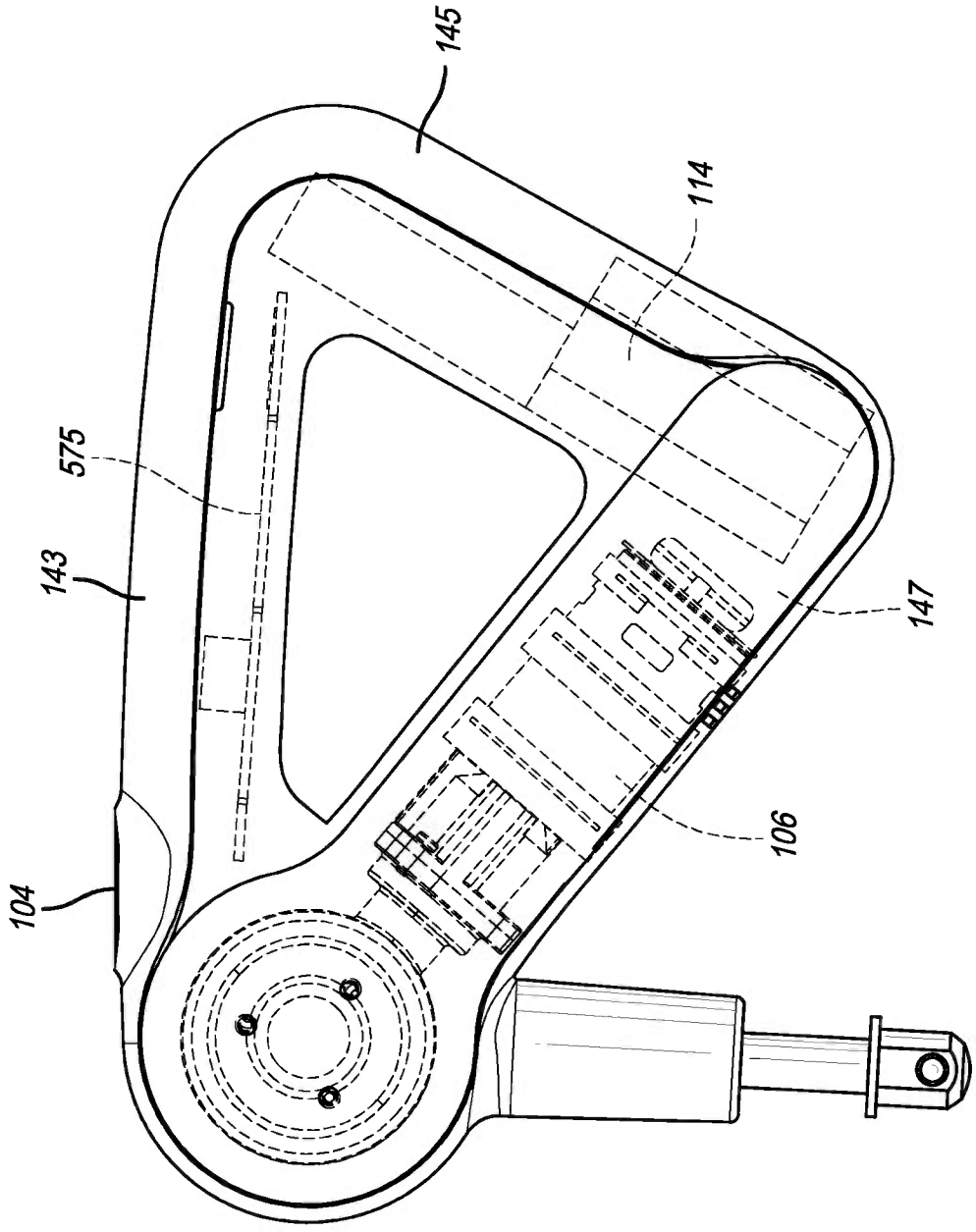


FIG. 13

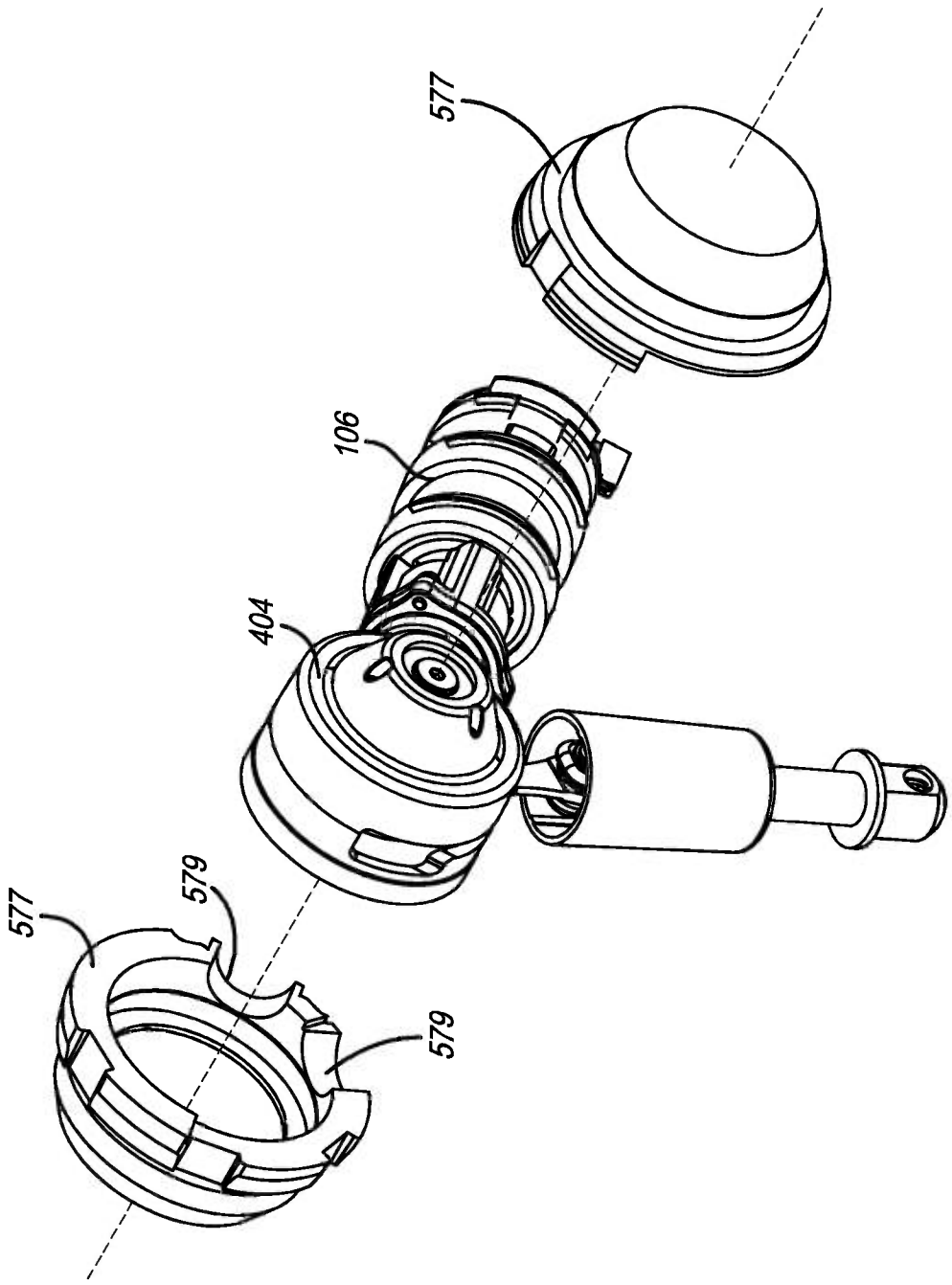


FIG. 14

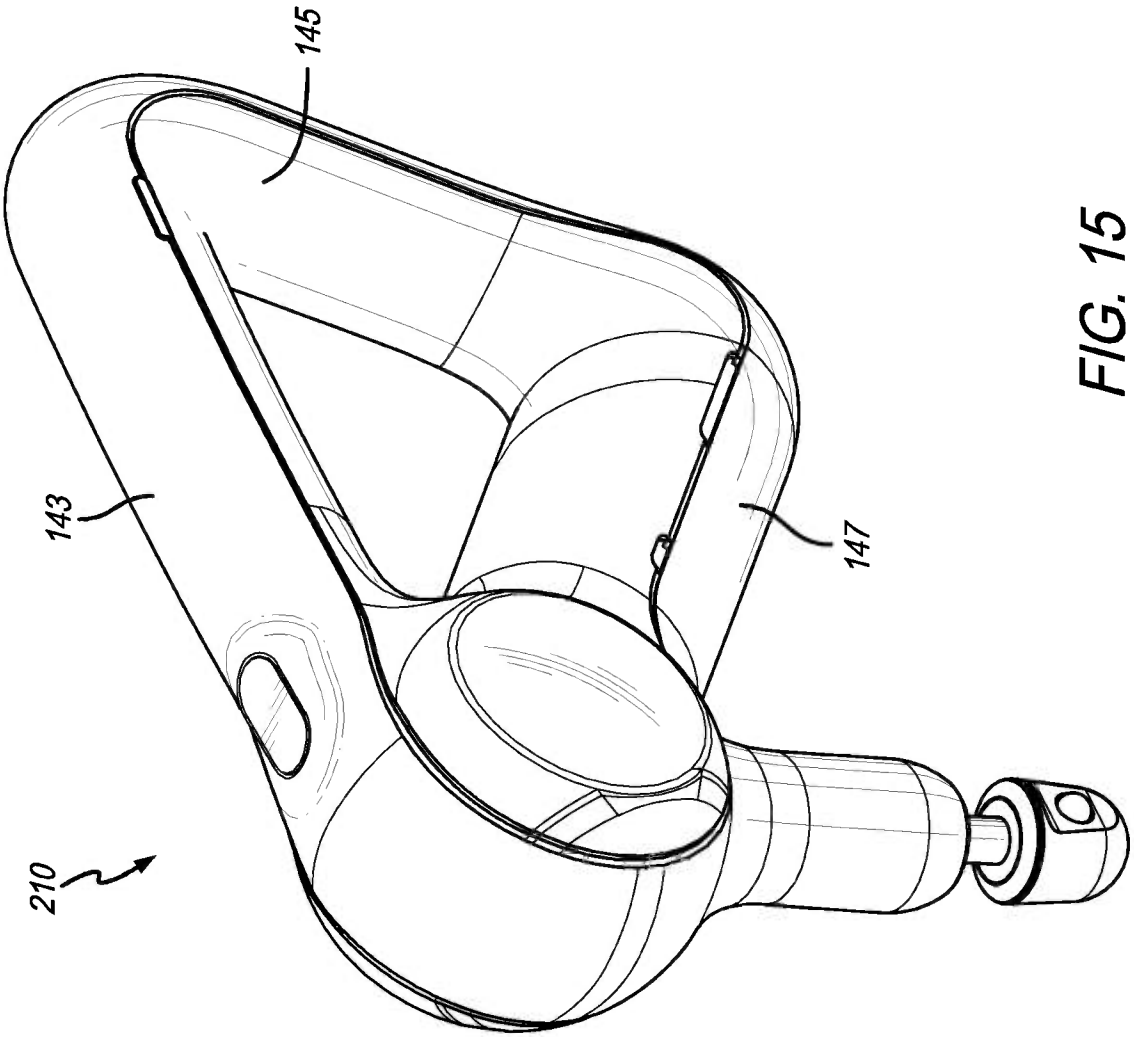


FIG. 15

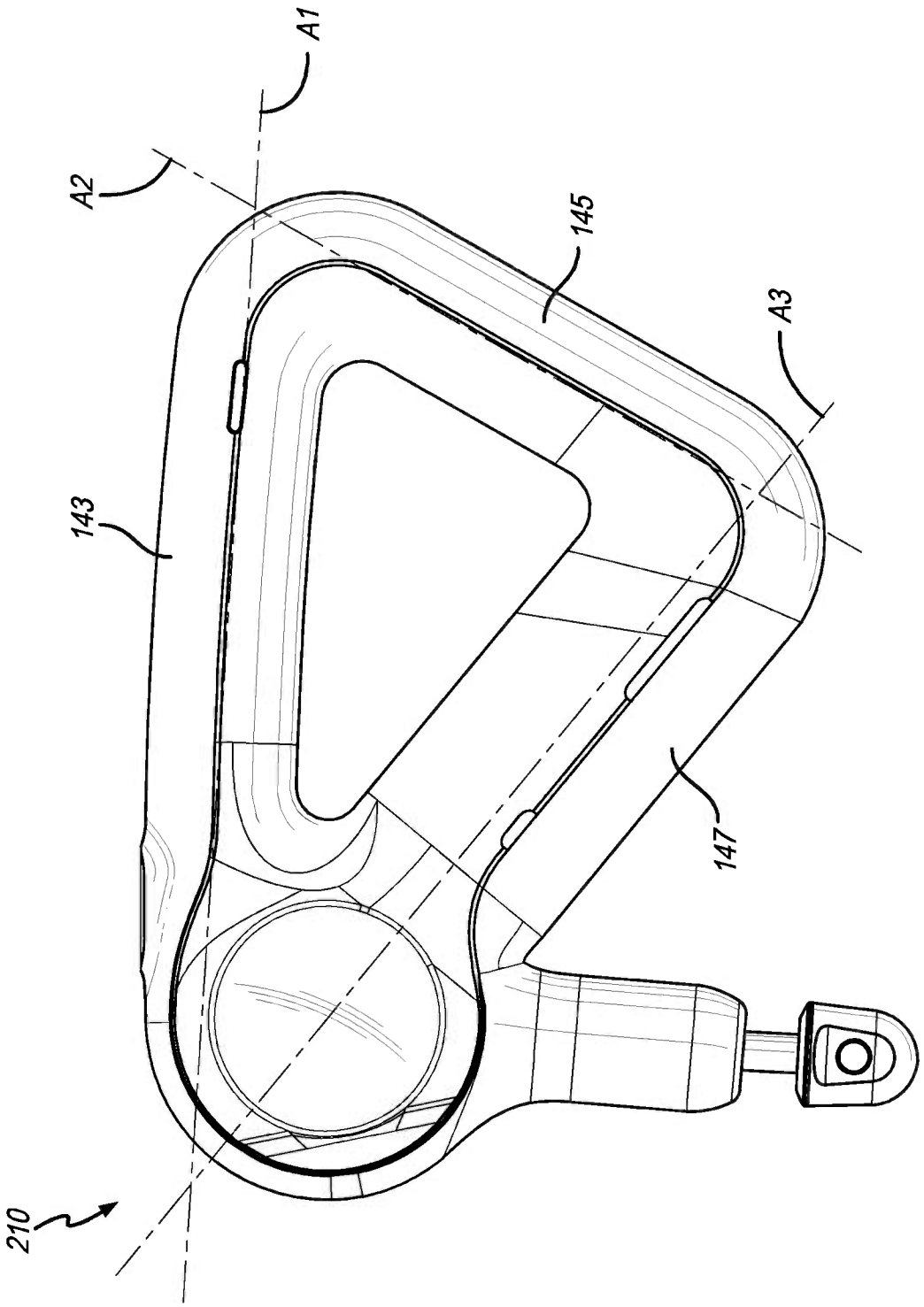


FIG. 16

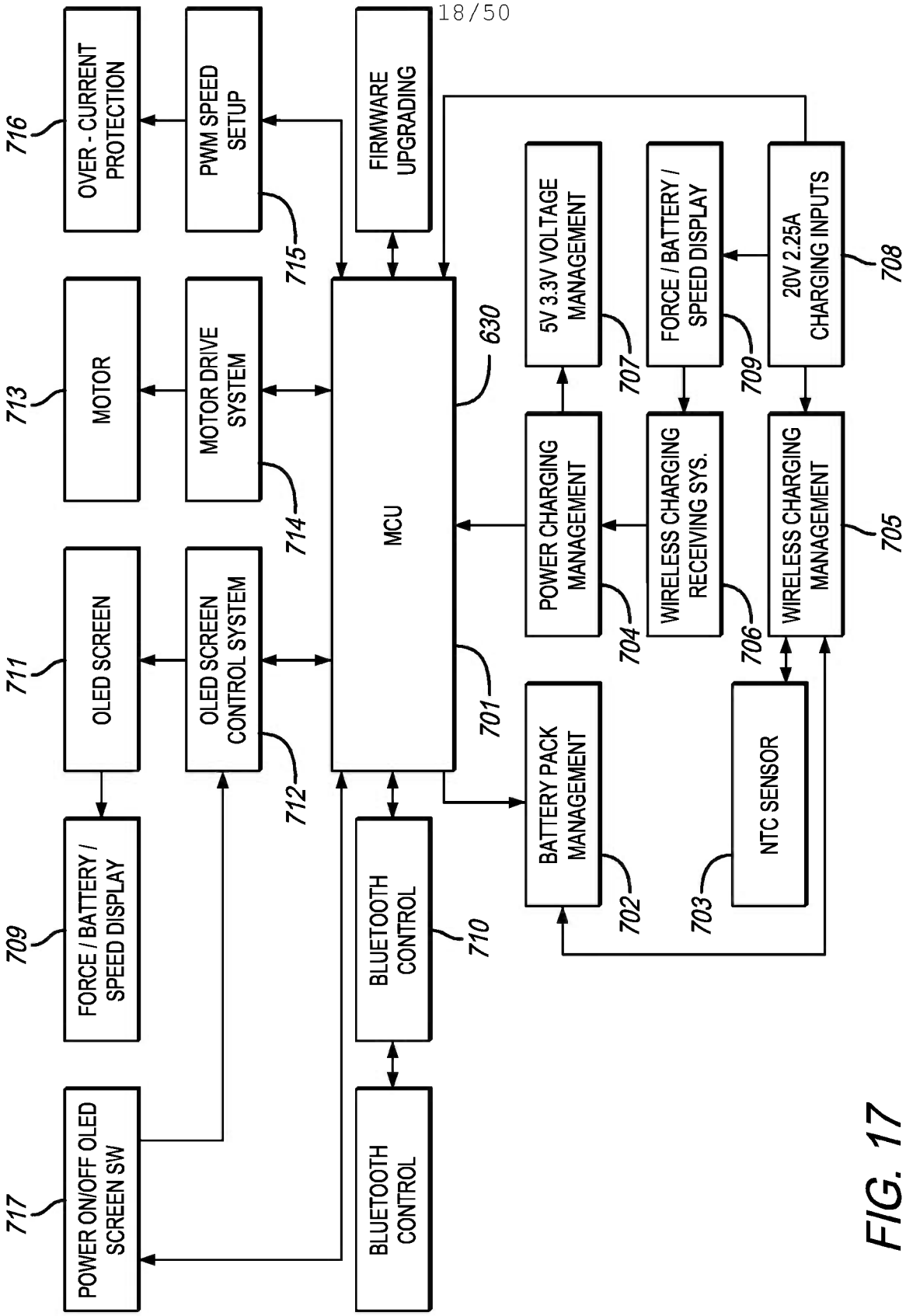

716
OVER - CURRENT PROTECTION
PWM SPEED SETUP
715
FIRMWARE UPGRADING
713
MOTOR
MOTOR DRIVE SYSTEM
714
MCU
630
5V 3.3V VOLTAGE MANAGEMENT
707
FORCE / BATTERY / SPEED DISPLAY
709
20V 2.25A CHARGING INPUTS
708
711
OLED SCREEN
OLED SCREEN CONTROL SYSTEM
712
701
POWER CHARGING MANAGEMENT
704
WIRELESS CHARGING RECEIVING SYS.
706
WIRELESS CHARGING MANAGEMENT
705
709
FORCE / BATTERY / SPEED DISPLAY
BLUETOOTH CONTROL
710
BATTERY PACK MANAGEMENT
702
NTC SENSOR
703
717
POWER ON/OFF OLED SCREEN SW
BLUETOOTH CONTROL

FIG. 17

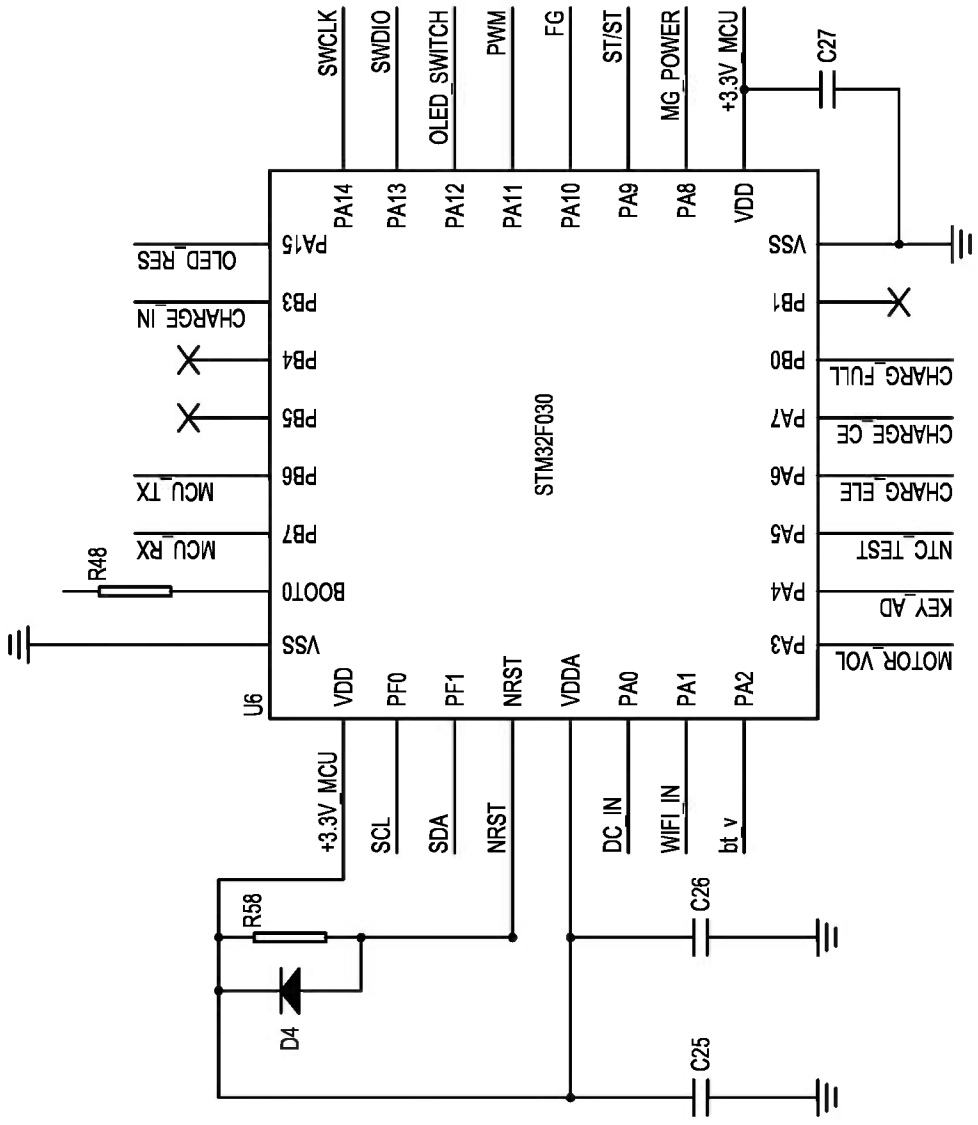

SWCLK
SWDIO
OLED_SWITCH
PWM
FG
ST/ST
MG_POWER
+3.3V_MCU
C27
PA14
PA13
PA12
PA11
PA10
PA9
PA8
VDD
PA15
PB3
PB4
PB5
PB6
PB7
BOOT0
VSS
VSS
PB1
PB0
PA7
PA6
PA5
PA4
PA3
OLED_RES
CHARGE_IN
MCU_TX
MCU_RX
R48
CHARG_FULL
CHARGE_CE
CHARG_ELE
NTC_TEST
KEY_AD
MOTOR_VOL
STM32F030
U6
VDD
PF0
PF1
NRST
VDDA
PA0
PA1
PA2
+3.3V_MCU
SCL
SDA
NRST
DC_IN
WIFI_IN
bt_v
R58
C26
D4
C25

FIG. 18

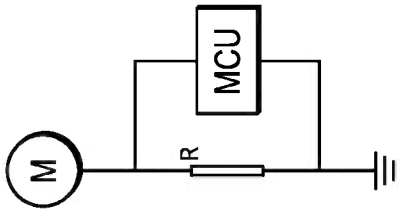


FIG. 20

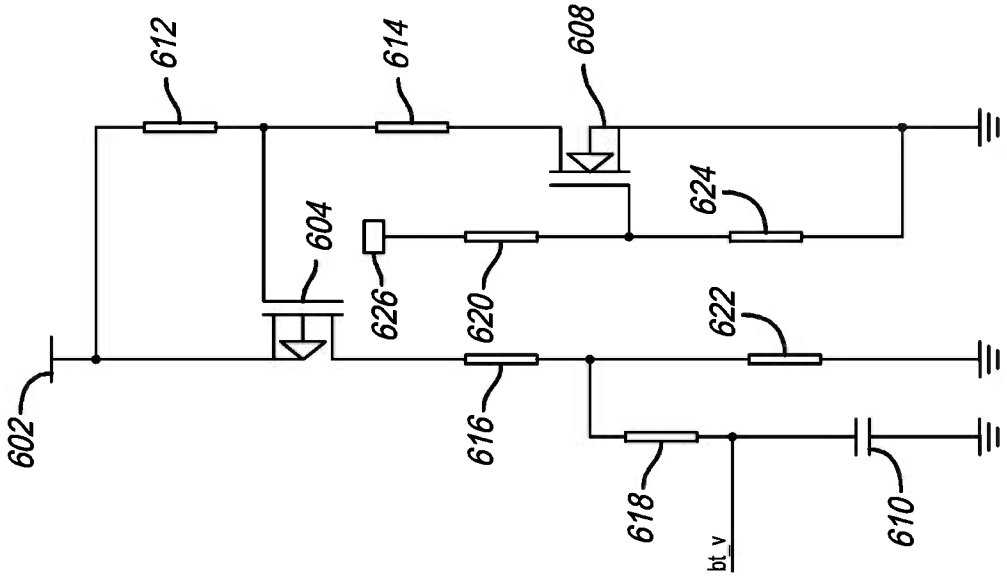


FIG. 19

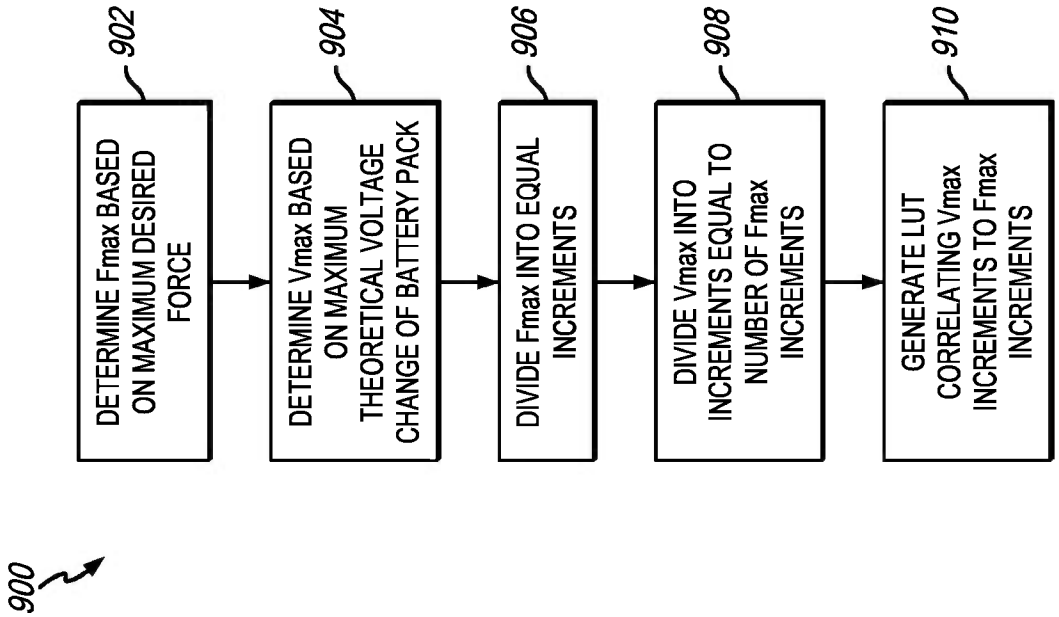

900
902
DETERMINE Fmax BASED ON MAXIMUM DESIRED FORCE
904
DETERMINE Vmax BASED ON MAXIMUM THEORETICAL VOLTAGE CHANGE OF BATTERY PACK
906
DIVIDE Fmax INTO EQUAL INCREMENTS
908
DIVIDE Vmax INTO INCREMENTS EQUAL TO NUMBER OF Fmax INCREMENTS
910
GENERATE LUT CORRELATING Vmax INCREMENTS TO Fmax INCREMENTS

FIG. 22

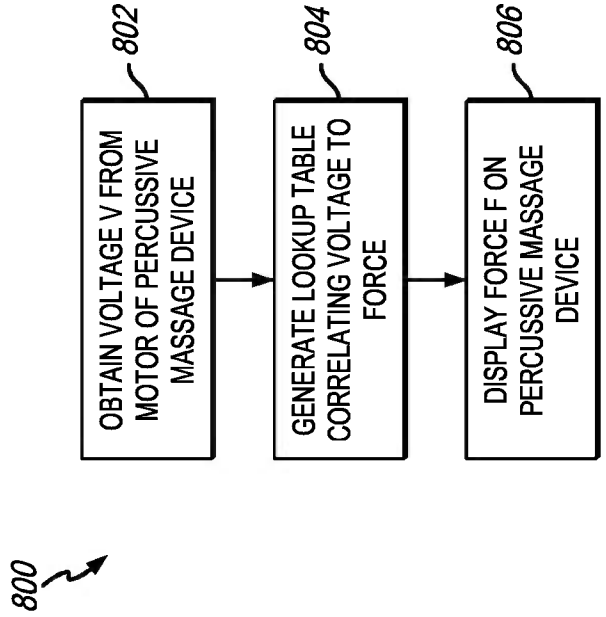
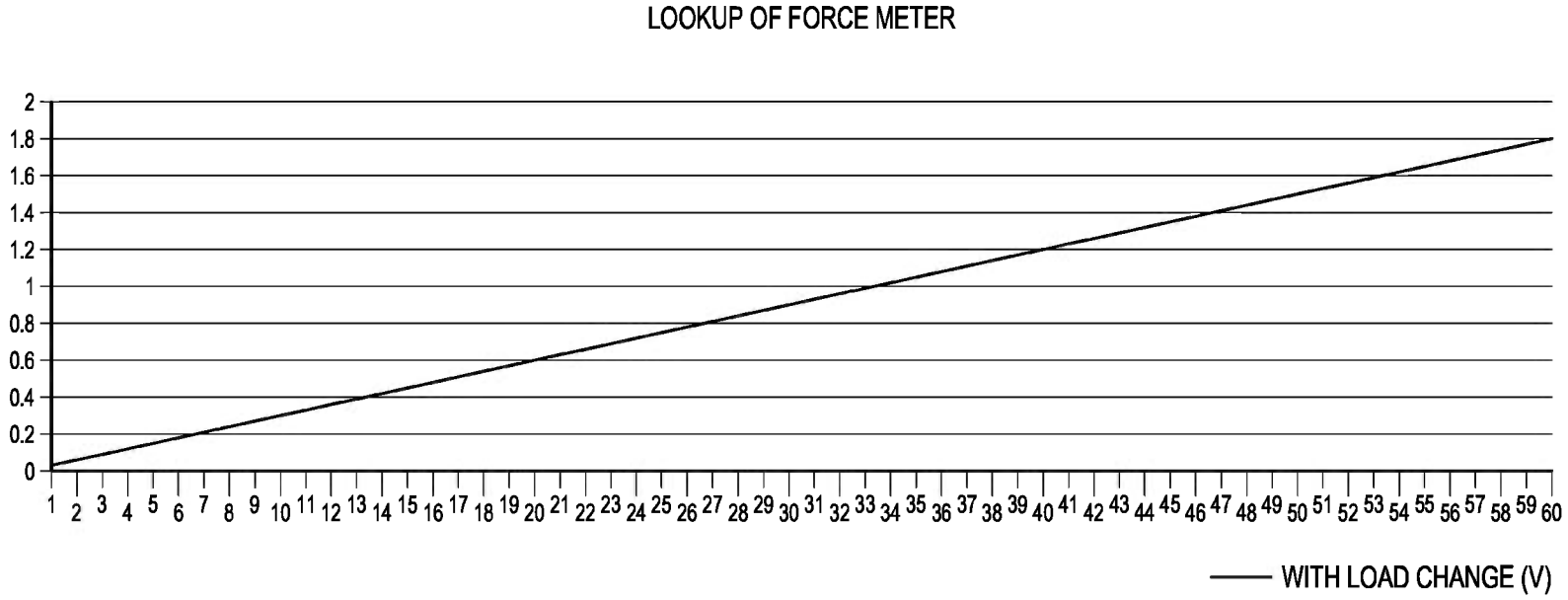

800
802
OBTAIN VOLTAGE V FROM MOTOR OF PERCUSSIVE MASSAGE DEVICE
804
GENERATE LOOKUP TABLE CORRELATING VOLTAGE TO FORCE
806
DISPLAY FORCE F ON PERCUSSIVE MASSAGE DEVICE

FIG. 21

POWER (W)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
FORCE (LB)	0.03	0.06	0.09	0.12	0.15	0.18	0.21	0.24	0.27	0.3	0.33	0.36	0.39	0.42	0.45	0.48	0.51	0.54	0.57	0.6	0.63	0.66	0.69	0.72	0.75	0.78	0.81	0.84	0.87	0.9	0.93	0.96	0.99	1.02	1.05	1.08	1.11	1.14	1.17	1.2	1.23	1.26	1.29	1.32	1.38	1.38	1.41	1.44	1.47

POWER (W)	50	51	52	53	54	55	56	57	58	59	60
FORCE (LB)	1.5	1.53	1.56	1.59	1.62	1.65	1.68	1.71	1.74	1.77	1.8



1120

22/50

FIG. 23

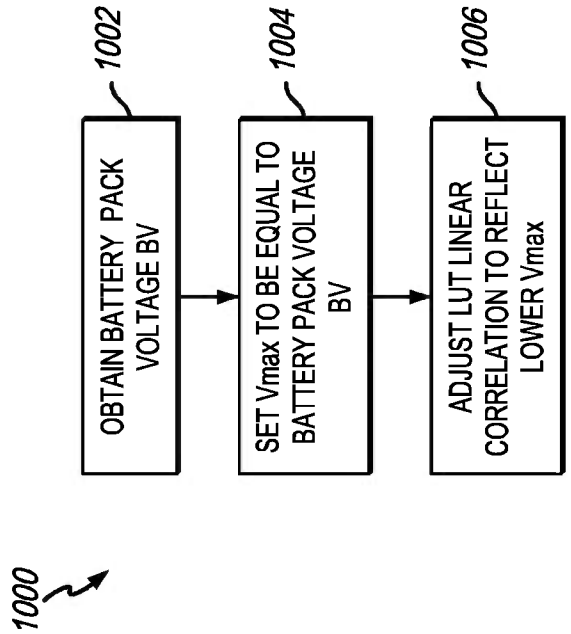

1000
1002
OBTAIN BATTERY PACK VOLTAGE BV
1004
SET Vmax TO BE EQUAL TO BATTERY PACK VOLTAGE BV
1006
ADJUST LUT LINEAR CORRELATION TO REFLECT LOWER Vmax

FIG. 24

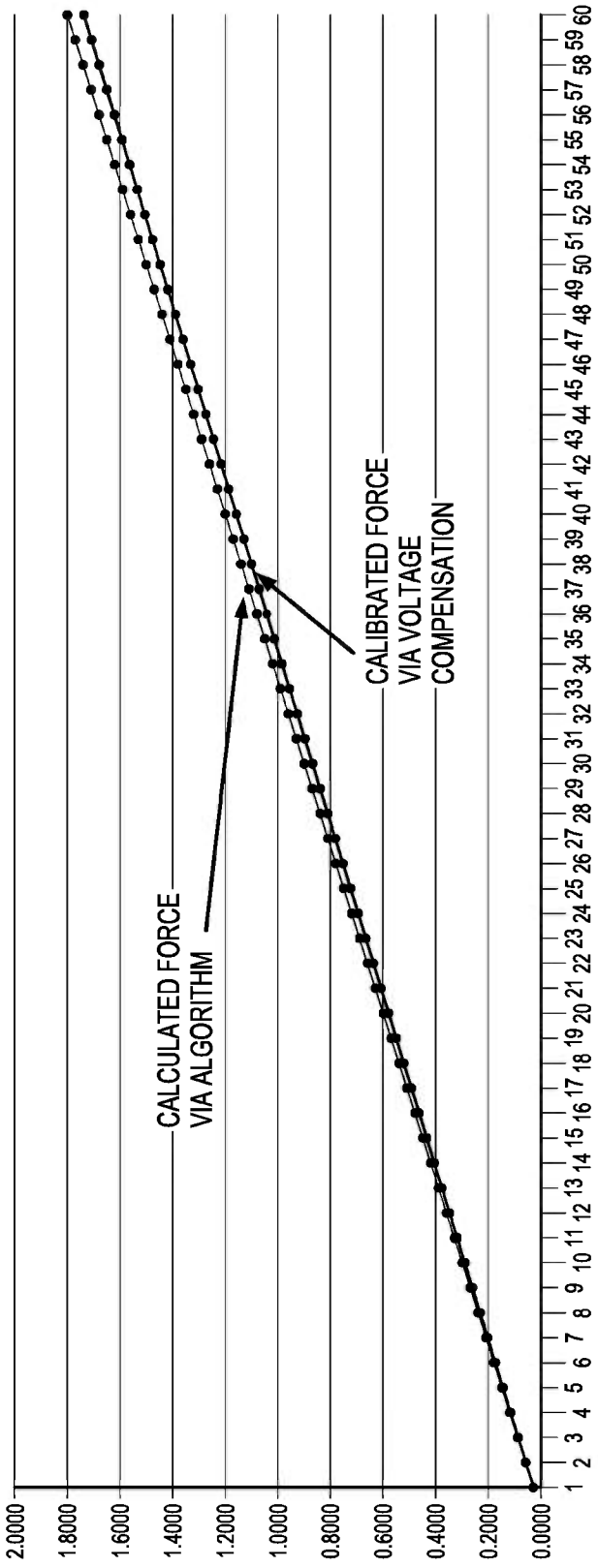

CALCULATED FORCE
VIA ALGORITHM
CALIBRATED FORCE
VIA VOLTAGE
COMPENSATION
2.0000
1.8000
1.6000
1.4000
1.2000
1.0000
0.8000
0.6000
0.4000
0.2000
0.0000
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

FIG. 25

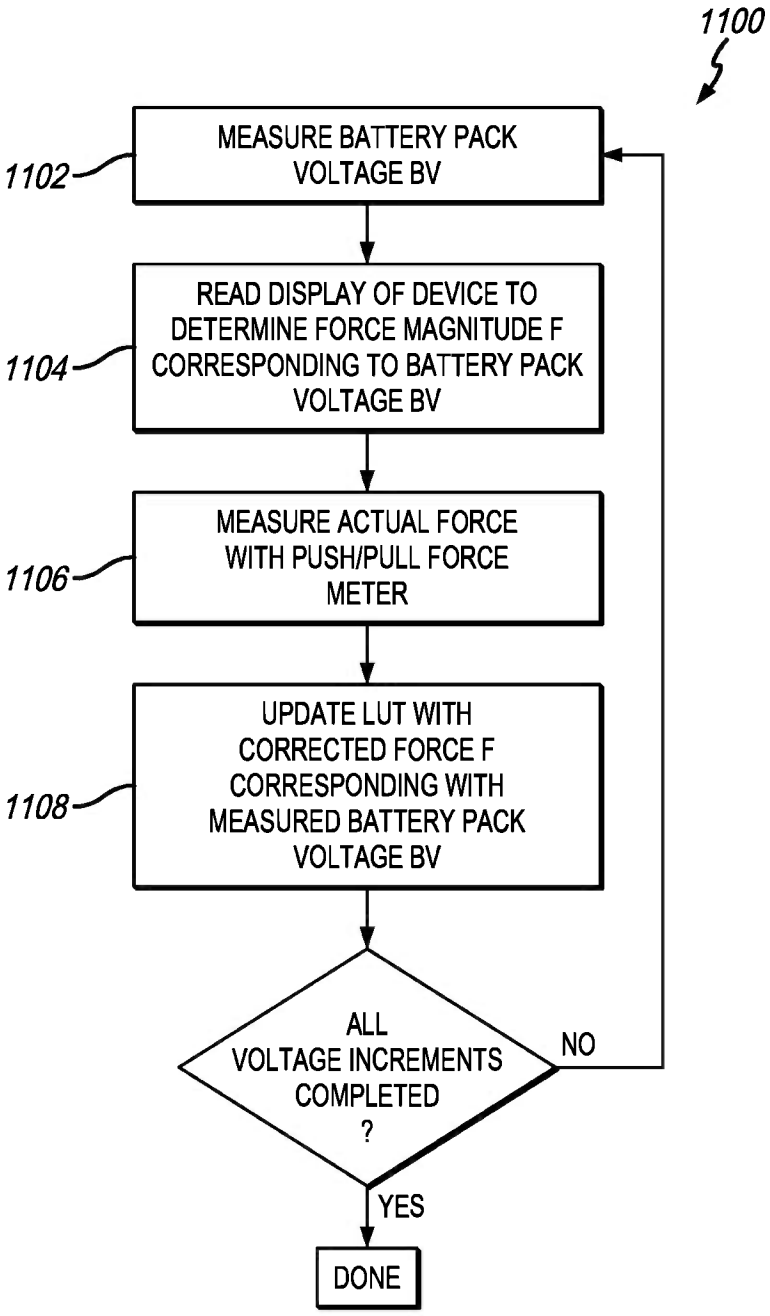

1100
1102
MEASURE BATTERY PACK VOLTAGE BV
1104
READ DISPLAY OF DEVICE TO DETERMINE FORCE MAGNITUDE F CORRESPONDING TO BATTERY PACK VOLTAGE BV
1106
MEASURE ACTUAL FORCE WITH PUSH/PULL FORCE METER
1108
UPDATE LUT WITH CORRECTED FORCE F CORRESPONDING WITH MEASURED BATTERY PACK VOLTAGE BV
ALL VOLTAGE INCREMENTS COMPLETED ?
NO
YES
DONE

FIG. 26

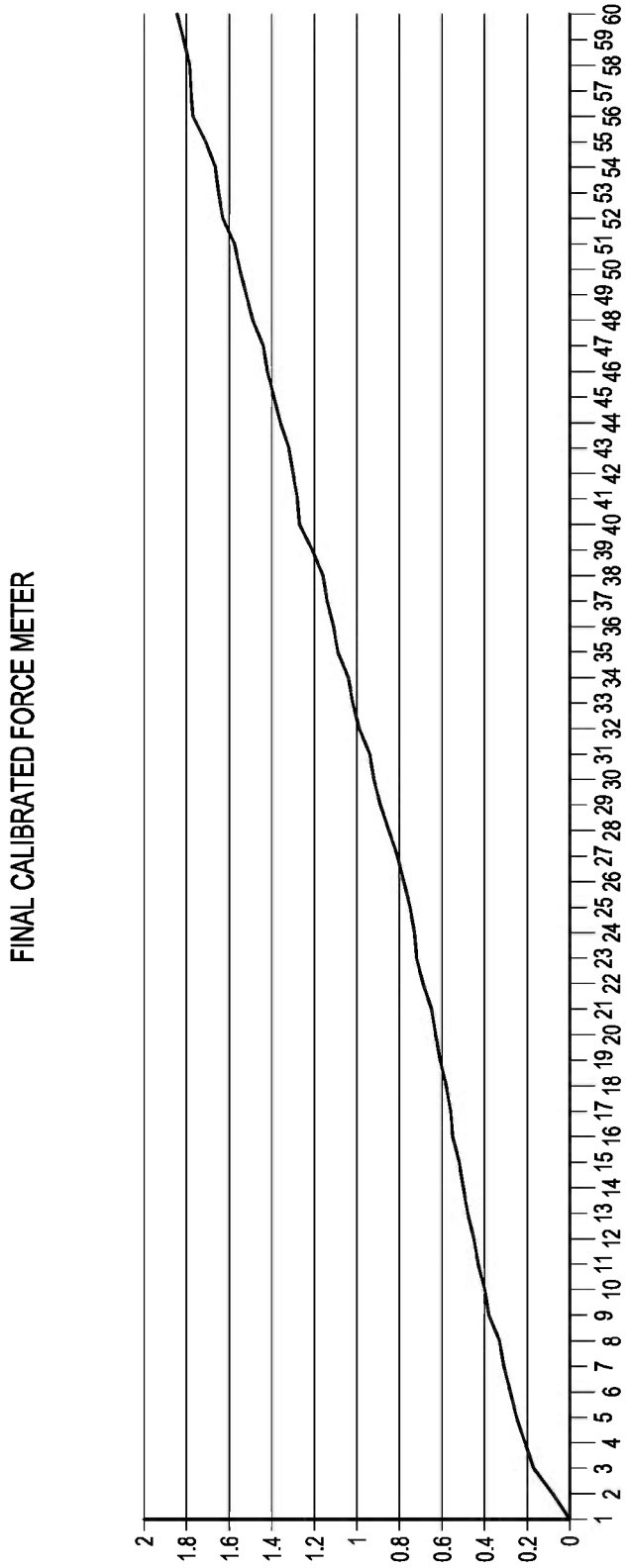

FINAL CALIBRATED FORCE METER
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

FIG. 27

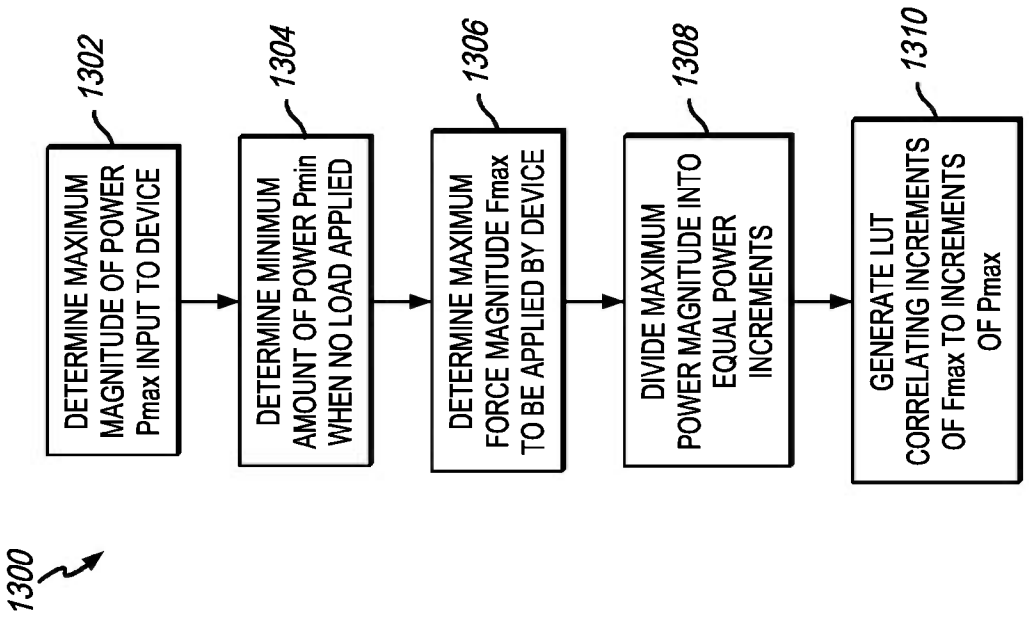

1300
DETERMINE MAXIMUM MAGNITUDE OF POWER Pmax INPUT TO DEVICE
1302
DETERMINE MINIMUM AMOUNT OF POWER Pmin WHEN NO LOAD APPLIED
1304
DETERMINE MAXIMUM FORCE MAGNITUDE Fmax TO BE APPLIED BY DEVICE
1306
DIVIDE MAXIMUM POWER MAGNITUDE INTO EQUAL POWER INCREMENTS
1308
GENERATE LUT CORRELATING INCREMENTS OF Fmax TO INCREMENTS OF Pmax
1310

FIG. 29

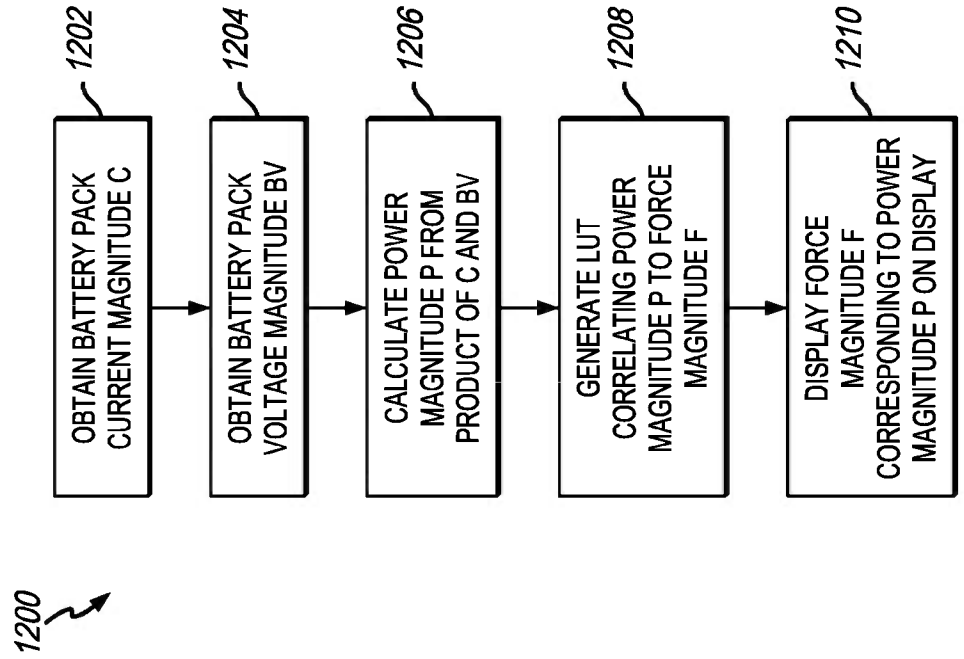
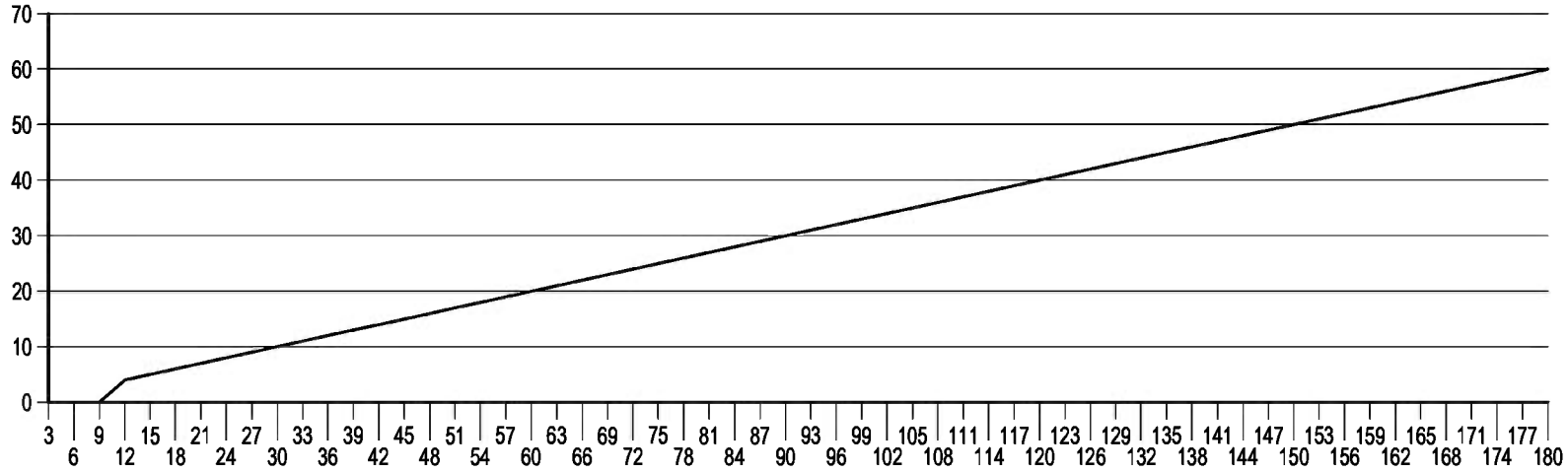

1200
OBTAIN BATTERY PACK CURRENT MAGNITUDE C
1202
OBTAIN BATTERY PACK VOLTAGE MAGNITUDE BV
1204
CALCULATE POWER MAGNITUDE P FROM PRODUCT OF C AND BV
1206
GENERATE LUT CORRELATING POWER MAGNITUDE P TO FORCE MAGNITUDE F
1208
DISPLAY FORCE MAGNITUDE F CORRESPONDING TO POWER MAGNITUDE P ON DISPLAY
1210

FIG. 28

POWER (W)	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63	66	69	72	75	78	81	84	87	90	93	96	99	102	105	108	111	114	117	120	123	126	129	132	135	138	141	144	147
FORCE (LB)	0	0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46

POWER (W)	150	153	156	159	162	165	168	171	174	177	180
FORCE (LB)	47	48	49	50	51	52	53	54	55	56	57

FORCE METER - POWER MODE



1126

FIG. 30

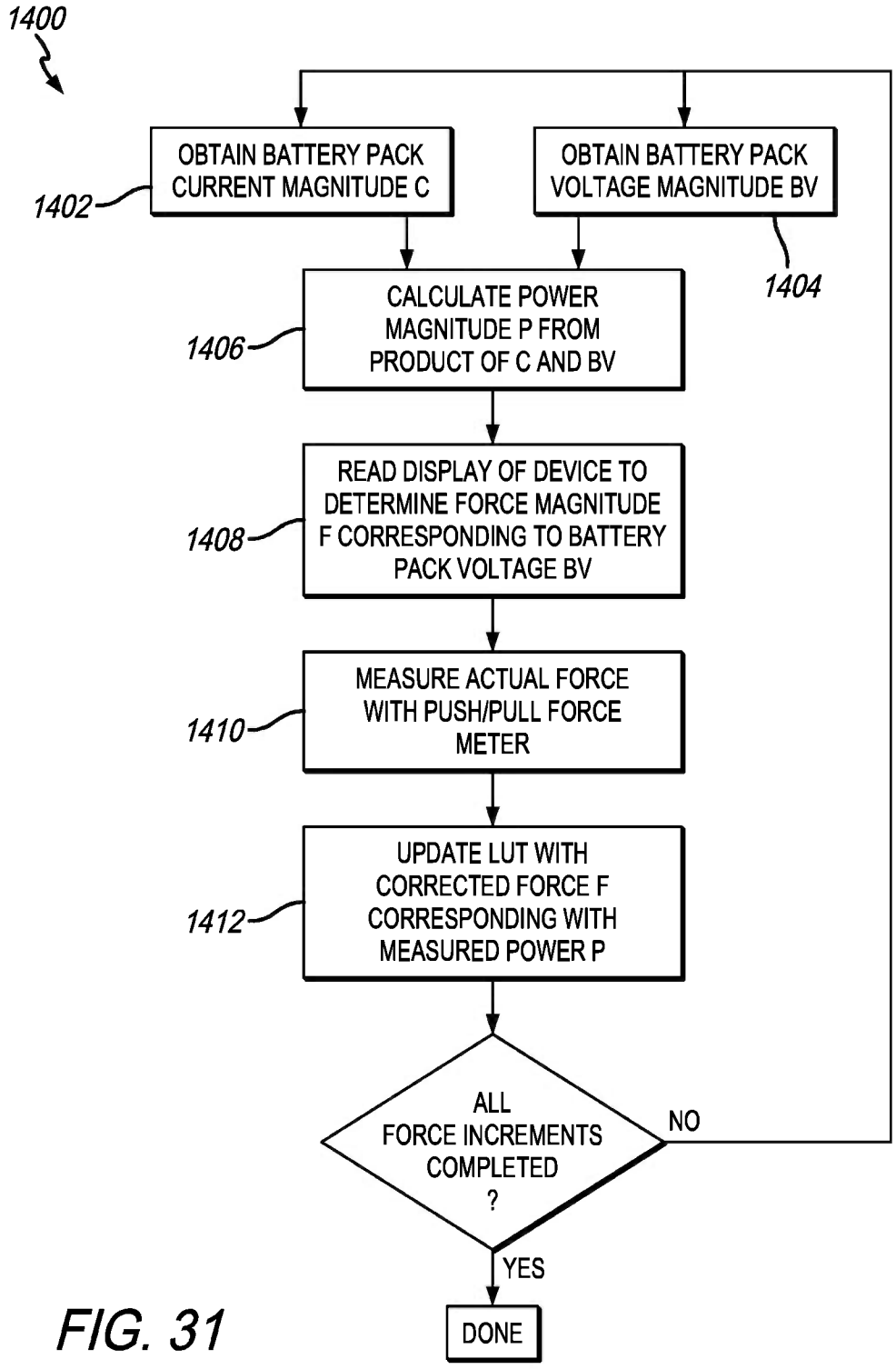

1400
OBTAIN BATTERY PACK CURRENT MAGNITUDE C
1402
OBTAIN BATTERY PACK VOLTAGE MAGNITUDE BV
1404
CALCULATE POWER MAGNITUDE P FROM PRODUCT OF C AND BV
1406
READ DISPLAY OF DEVICE TO DETERMINE FORCE MAGNITUDE F CORRESPONDING TO BATTERY PACK VOLTAGE BV
1408
MEASURE ACTUAL FORCE WITH PUSH/PULL FORCE METER
1410
UPDATE LUT WITH CORRECTED FORCE F CORRESPONDING WITH MEASURED POWER P
1412
ALL FORCE INCREMENTS COMPLETED ?
NO
YES
DONE

FIG. 31

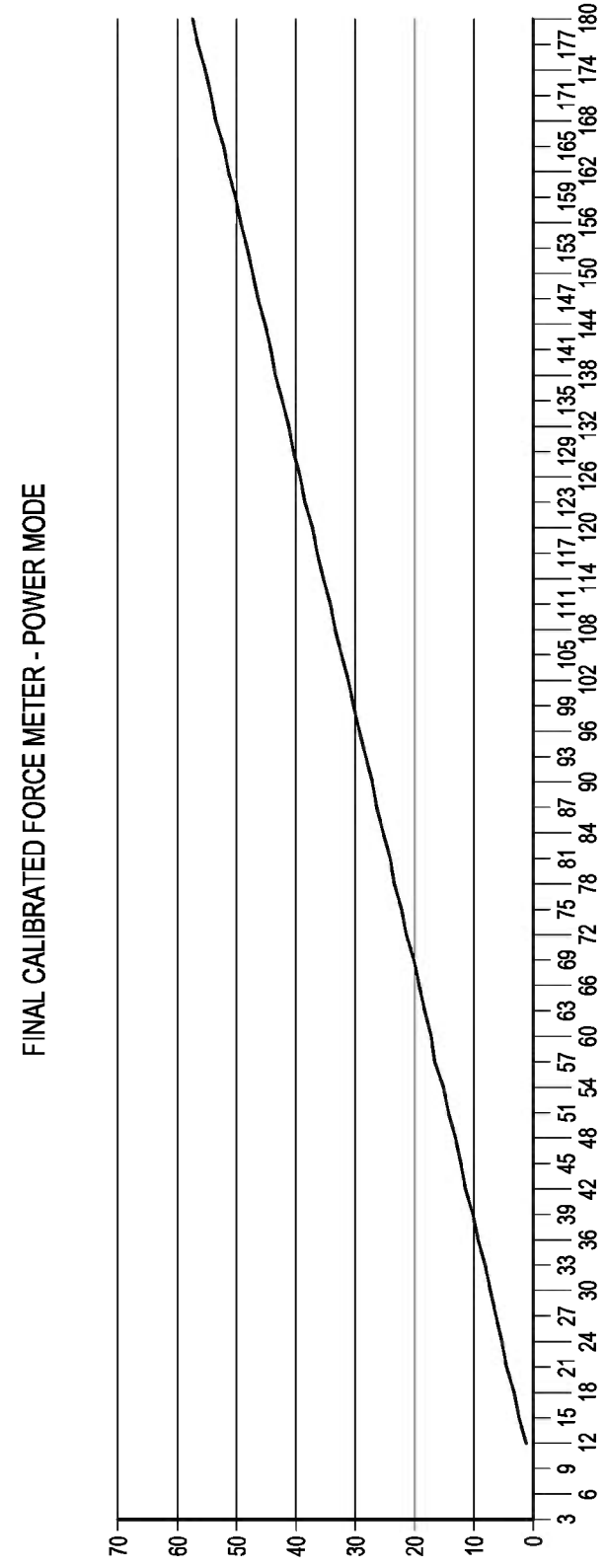

FINAL CALIBRATED FORCE METER - POWER MODE
70
60
50
40
30
20
10
0
3 6 9 12 15 18 21 24 27 30 33 36 39 42 45 48 51 54 57 60 63 66 69 72 75 78 81 84 87 90 93 96 99 102 105 108 111 114 117 120 123 126 129 132 135 138 141 144 147 150 153 156 159 162 165 168 171 174 177 180

FIG. 32

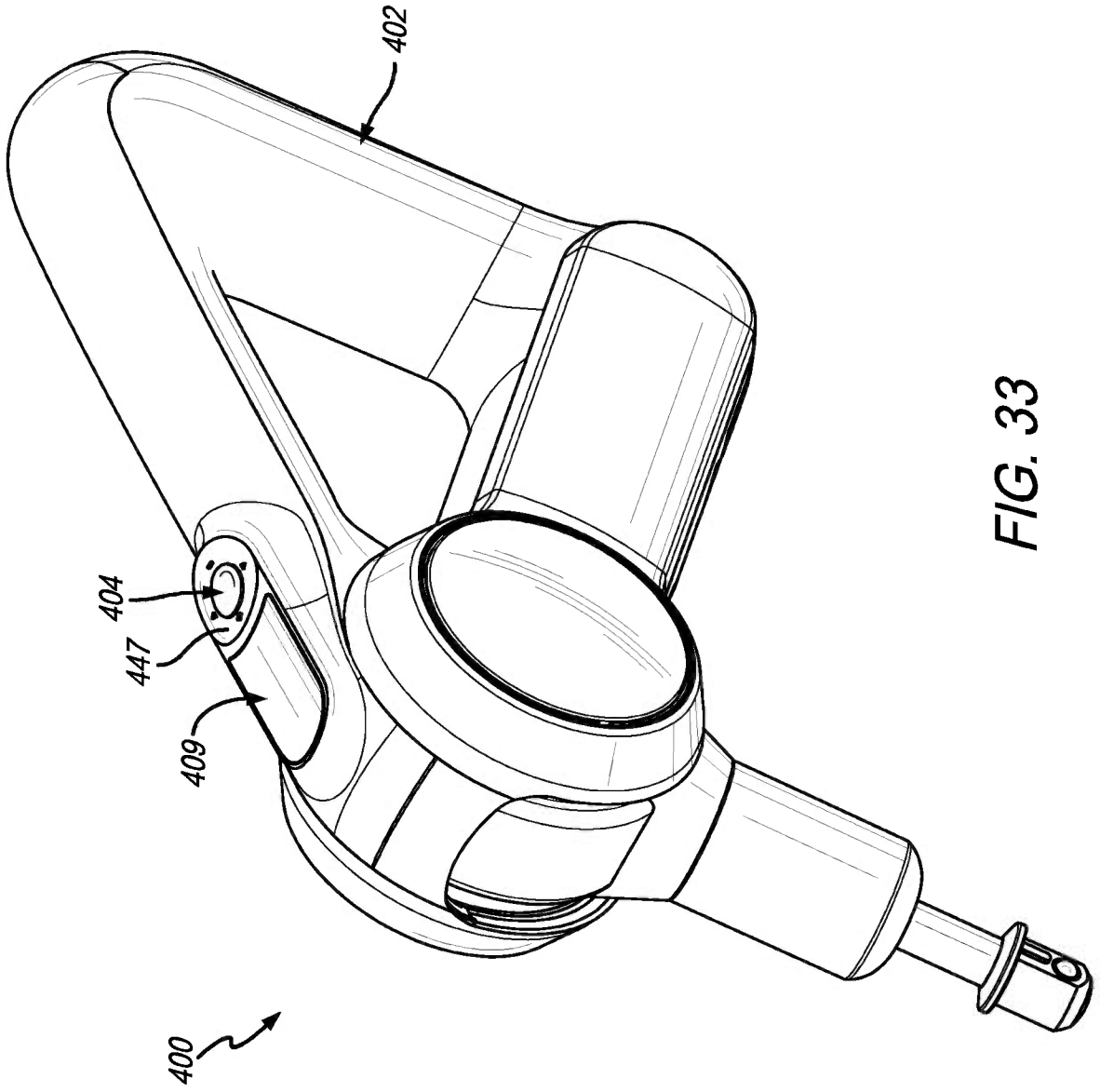


FIG. 33

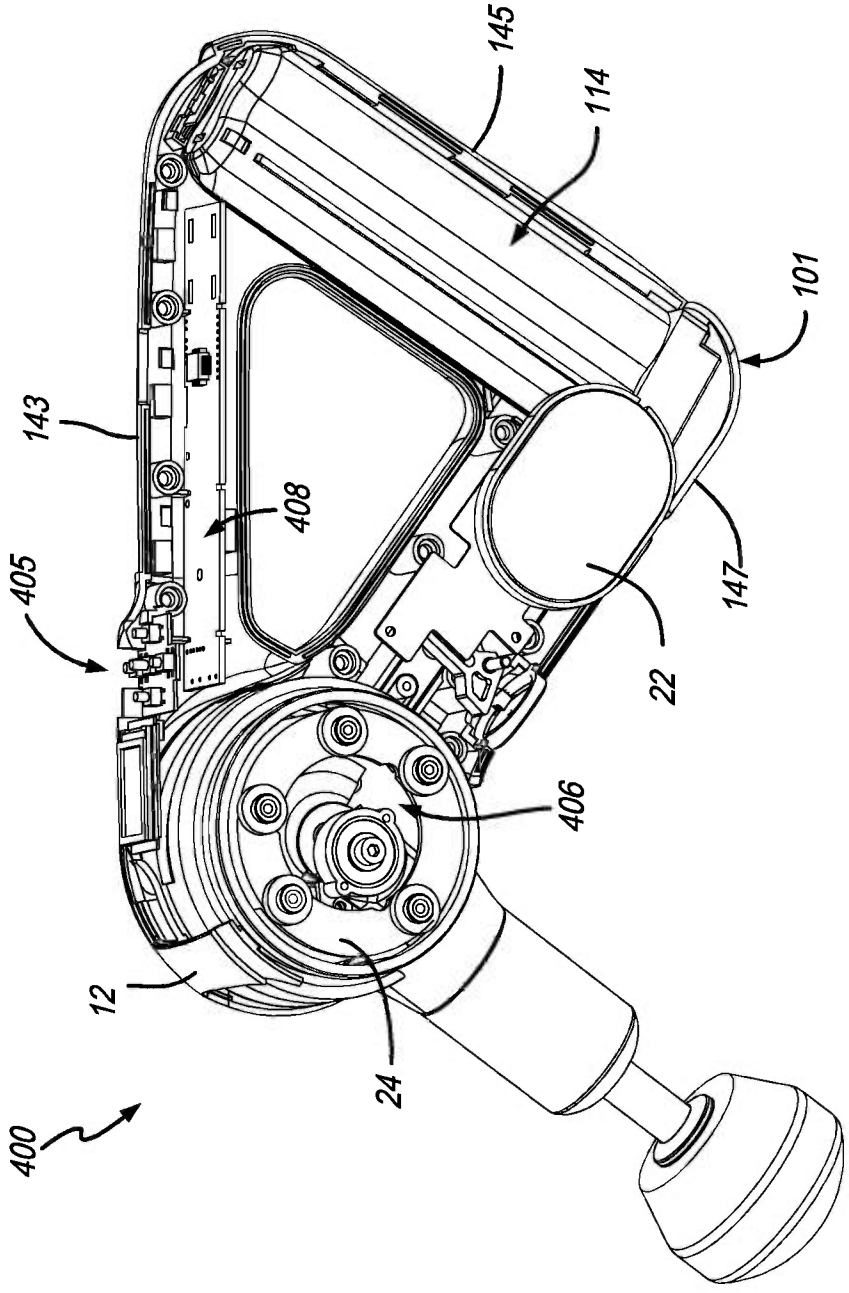


FIG. 34

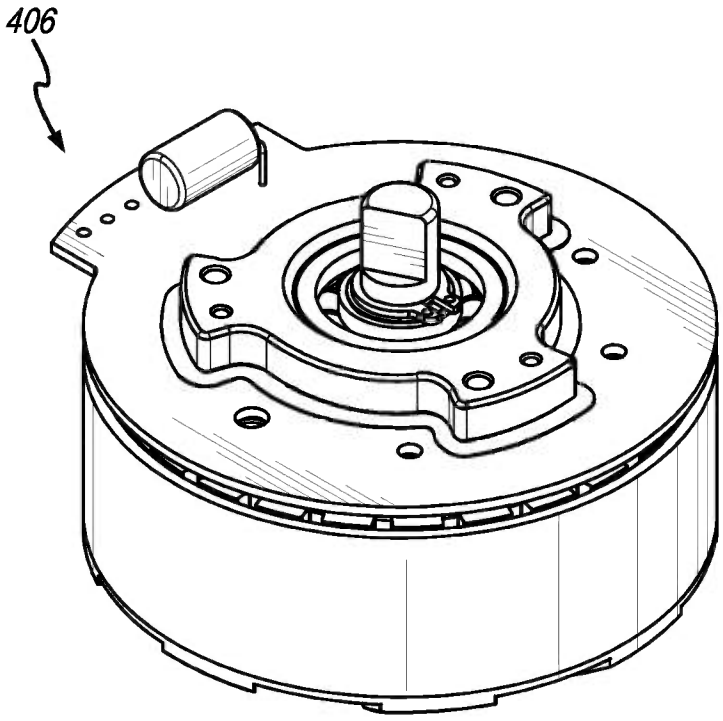


FIG. 35

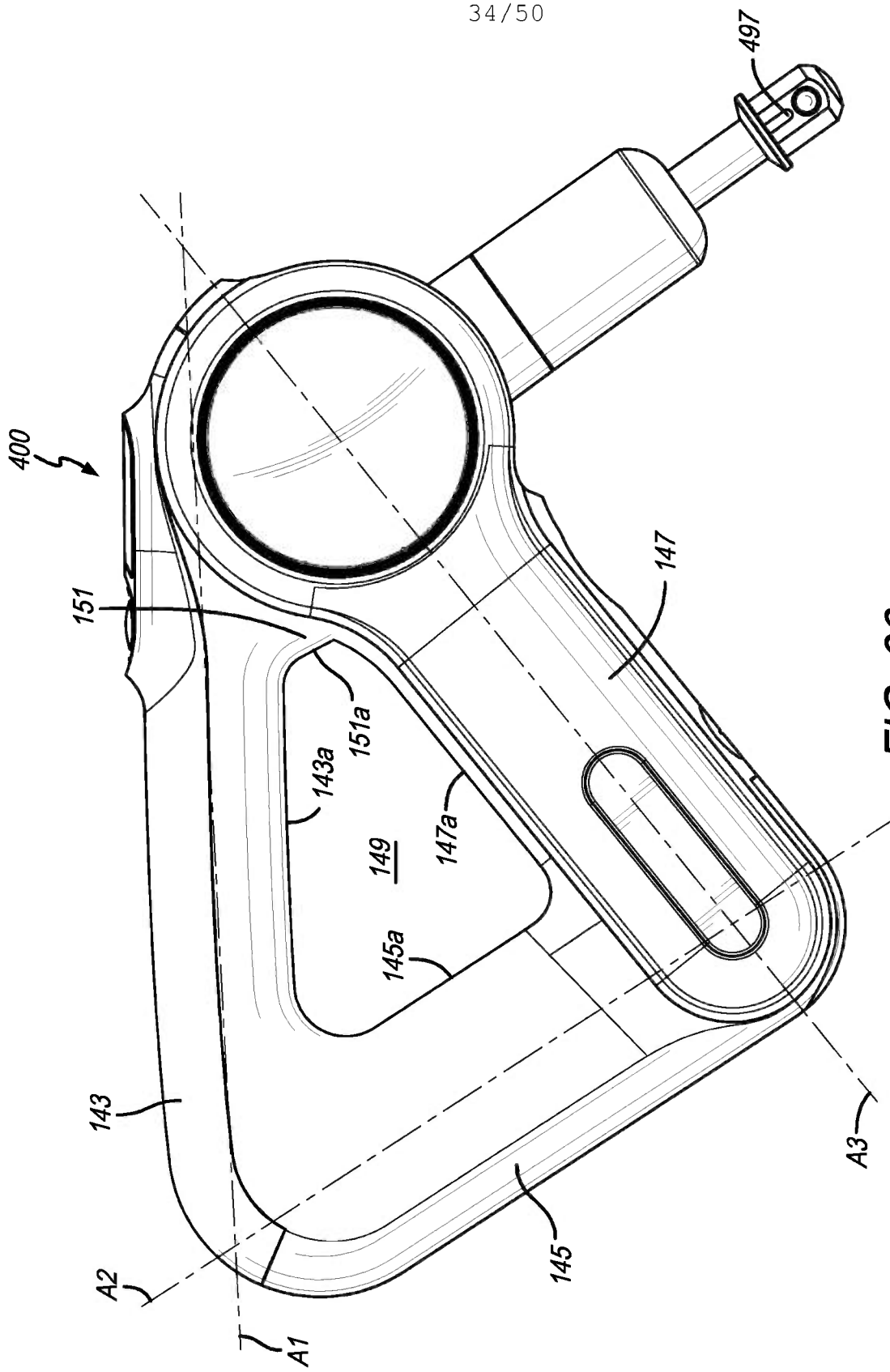


FIG. 36

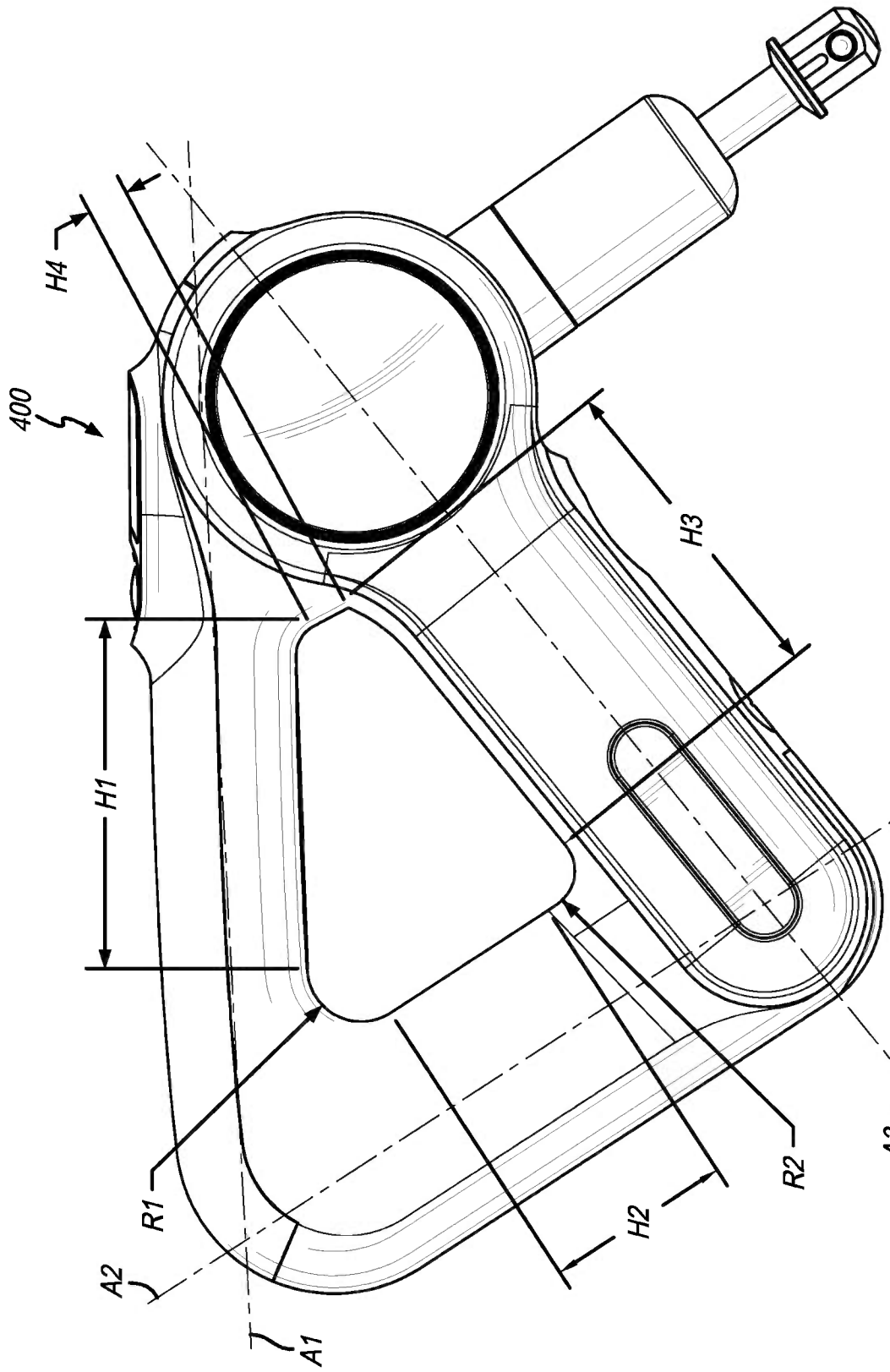


FIG. 37

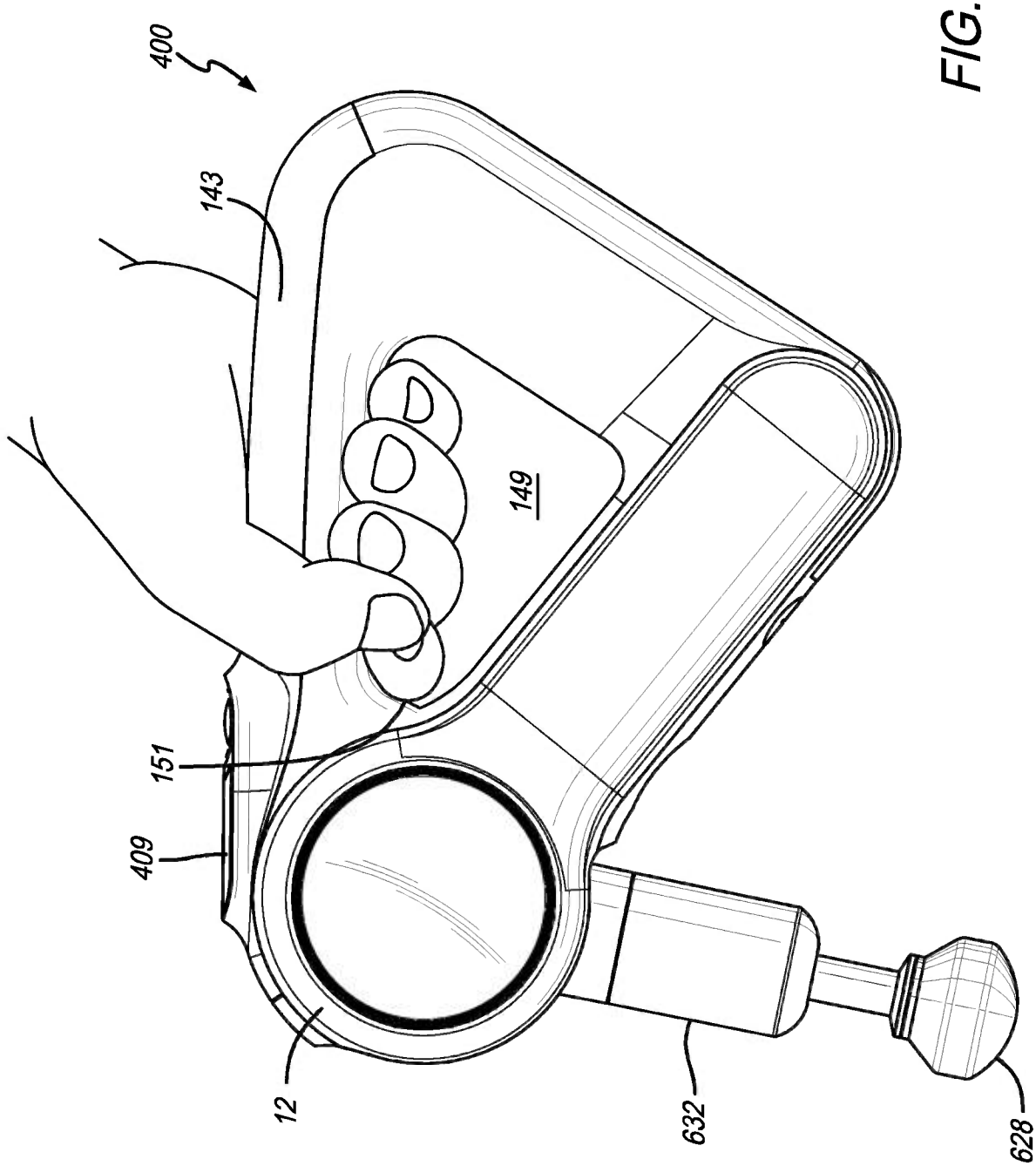


FIG. 38

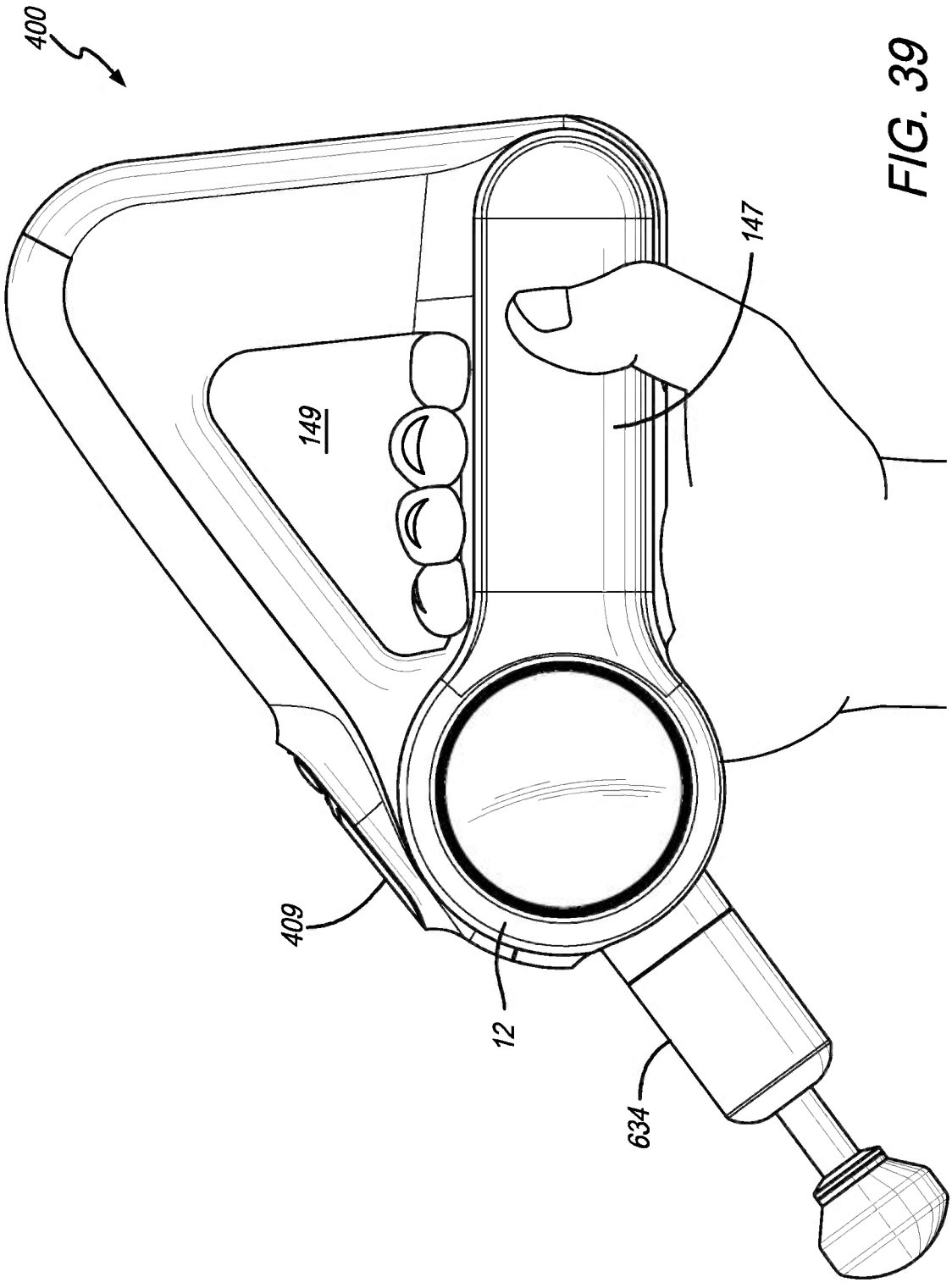


FIG. 39

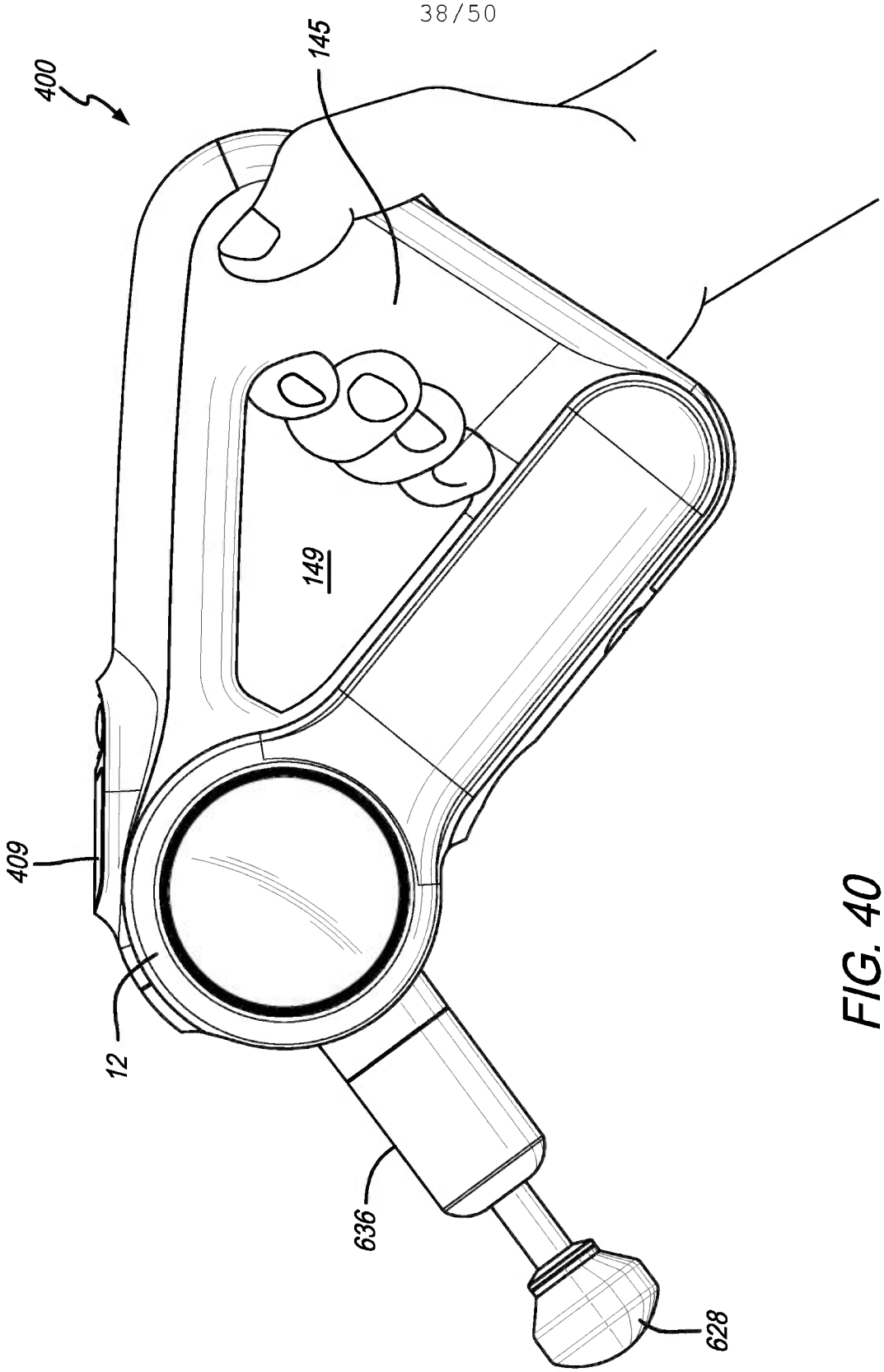


FIG. 40

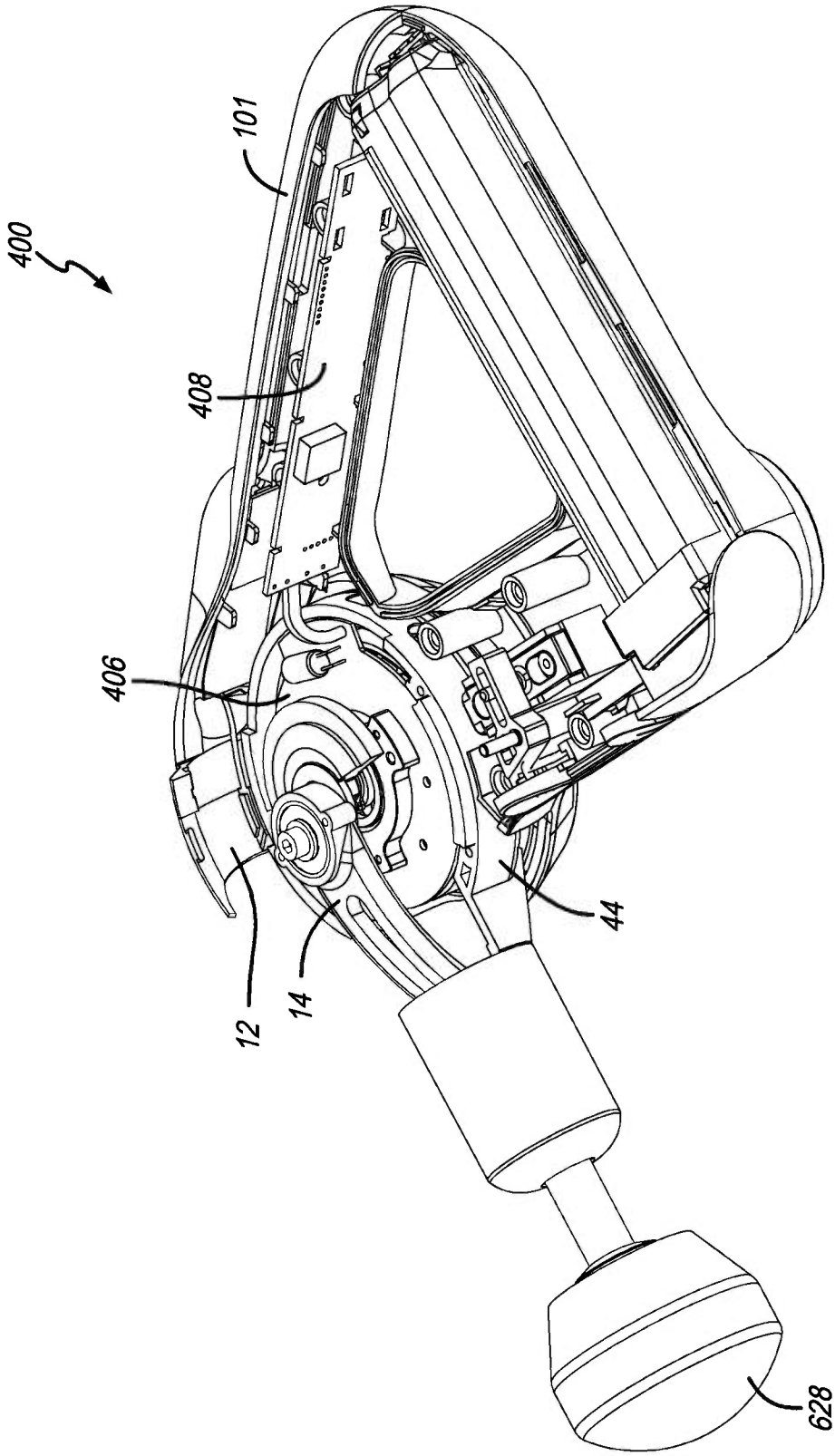


FIG. 41

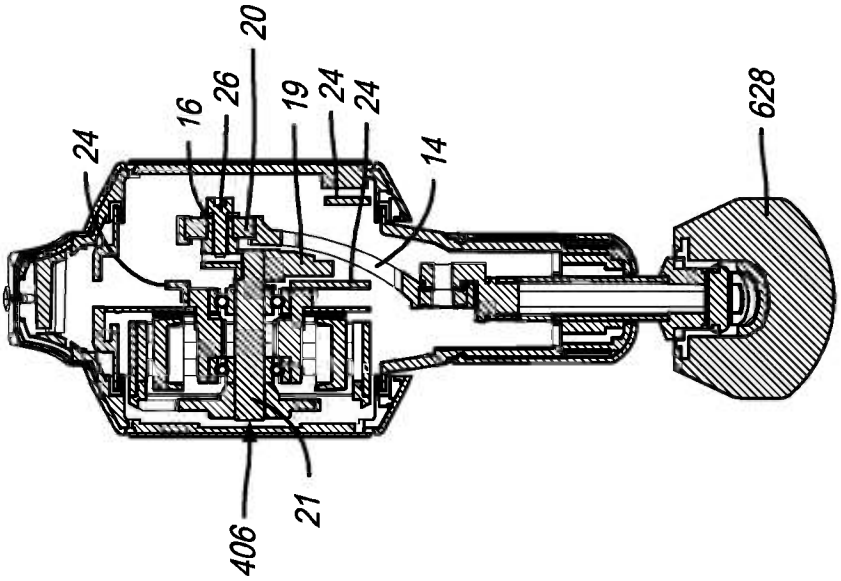


FIG. 42B

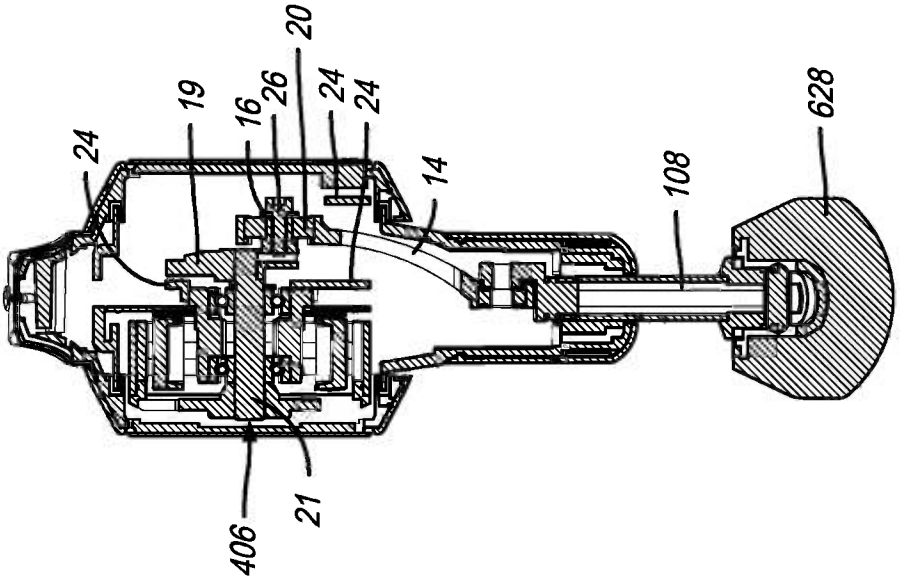


FIG. 42A

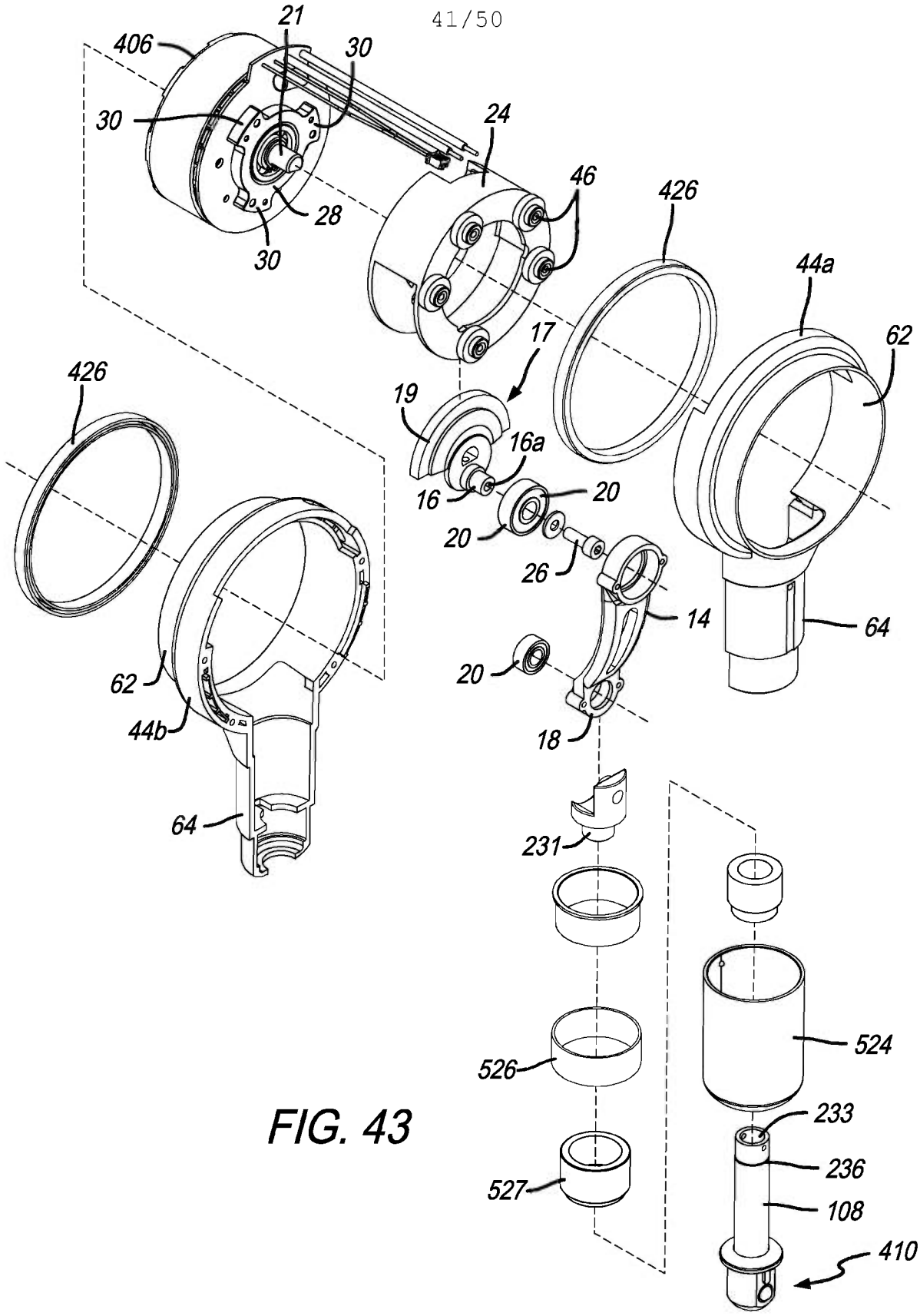

406
21
30
30
24
46
28
30
426
44a
62
17
426
19
16a
16
20
20
26
14
64
62
44b
20
18
64
231
524
526
233
236
527
108
410

FIG. 43

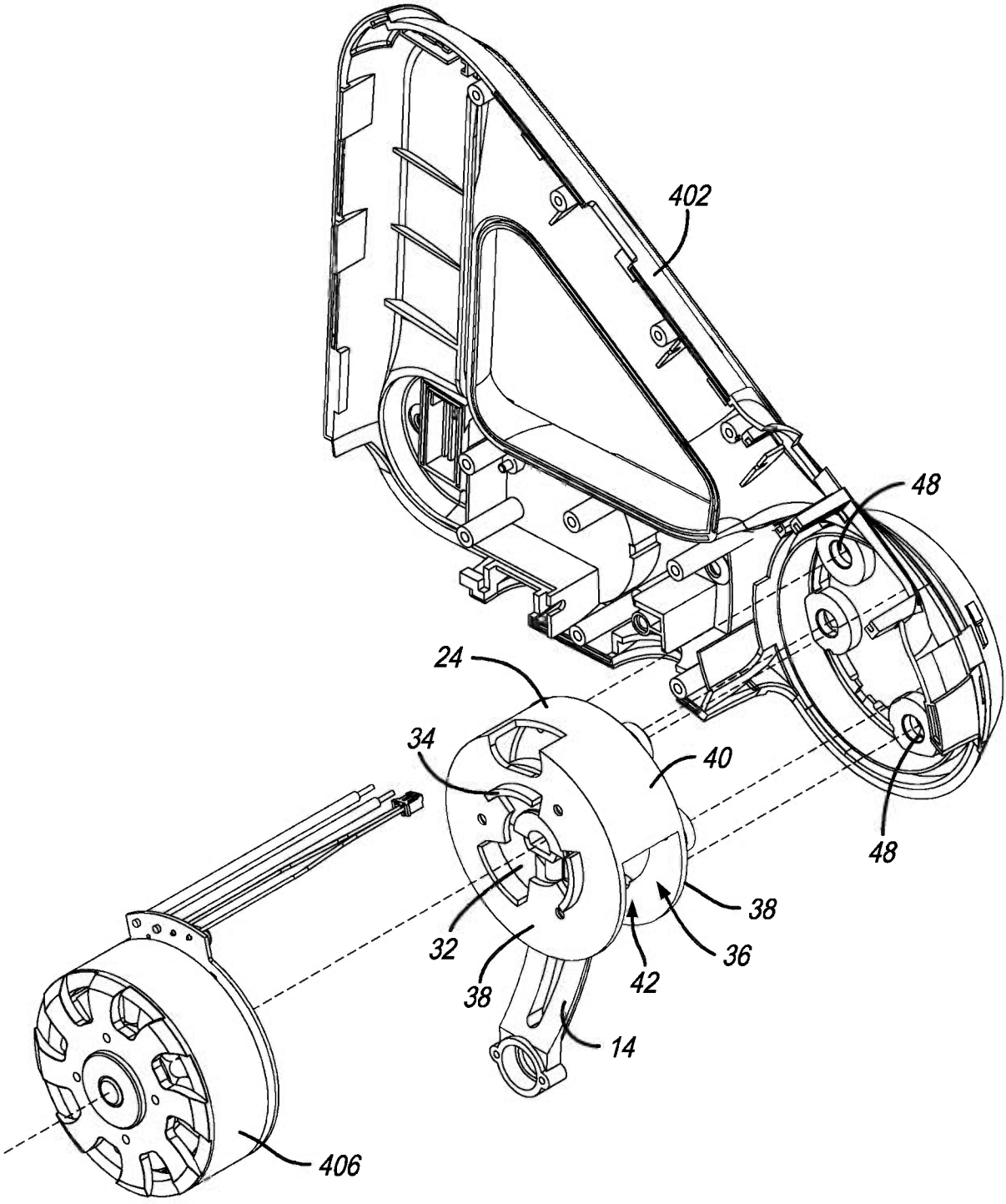


FIG. 43A

PROTOCOL 1

STEP	1	2	3	4
TIME(M)	0:30	0:15	0:30	0:45
SPEED (RPM)	1550	2100	2200	2400
AMPLITUDE	2	3	1	4
ATTACHMENT	DAMPENER	SMALL BALL	DAMPENER	LARGE BALL
FORCE	1	3	3	2
TEMPERATURE (°C)	21	26	29	32
GRIP	1	1	1	1

1141

FIG. 44

PROTOCOL: SHIN SPLINTS

STEP	1	2	3	4
TIME(M)	1:00	1:00	1:00	1:00
SPEED (RPM)	1500	1500	2000	2000
AMPLITUDE	1	1	3	3
ATTACHMENT	DAMPENER	DAMPENER	DAMPENER	DAMPENER
FORCE	2	2	3	3
TEMPERATURE (°C)	21	21	24	24
GRIP	REVERSE	REVERSE	BASE	BASE
ARM POSITION	1	1	1	1
BODY PART	R. SHIN	L. SHIN	R. CALF	L. CALF

1142

FIG. 45

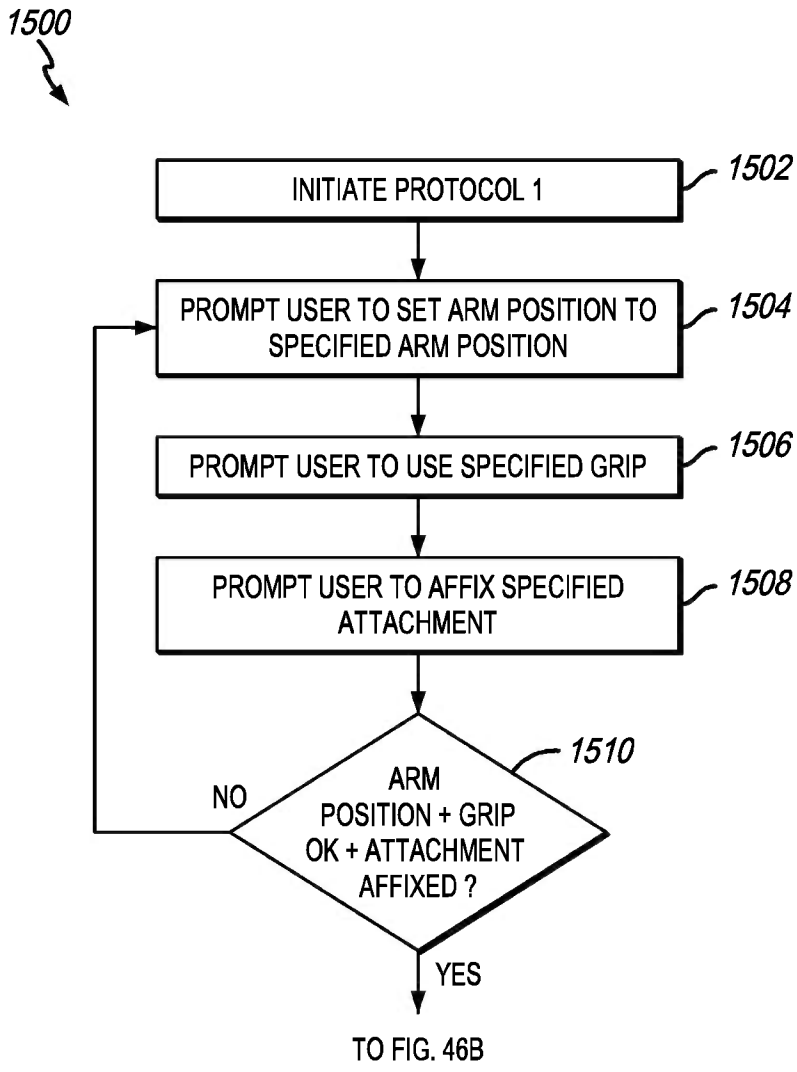

1500
INITIATE PROTOCOL 1
1502
PROMPT USER TO SET ARM POSITION TO SPECIFIED ARM POSITION
1504
PROMPT USER TO USE SPECIFIED GRIP
1506
PROMPT USER TO AFFIX SPECIFIED ATTACHMENT
1508
ARM POSITION + GRIP OK + ATTACHMENT AFFIXED ?
1510
NO
YES
TO FIG. 46B

FIG. 46A

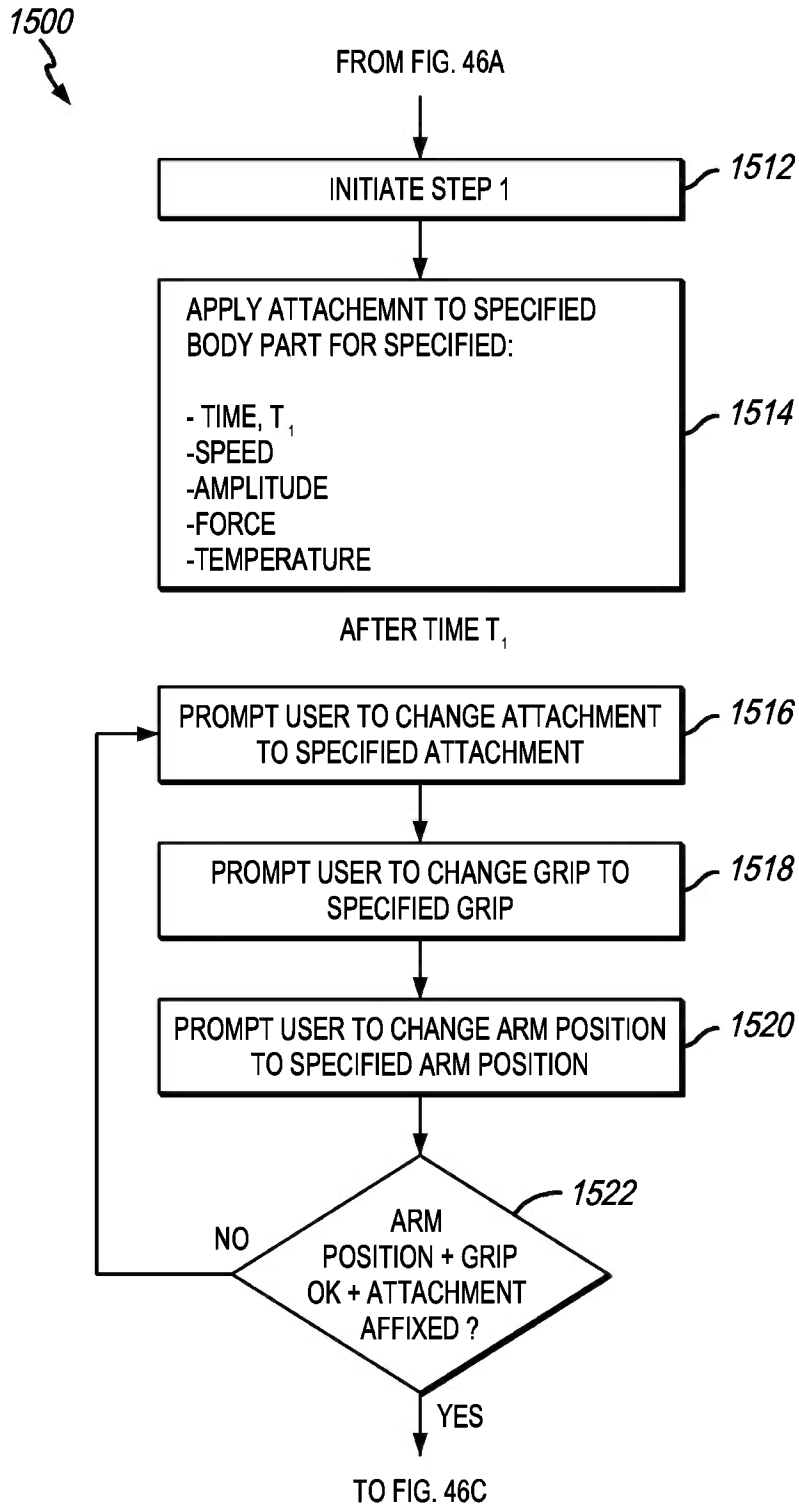

1500
FROM FIG. 46A
INITIATE STEP 1
1512
APPLY ATTACHEMNT TO SPECIFIED BODY PART FOR SPECIFIED:
- TIME, T_1
-SPEED
-AMPLITUDE
-FORCE
-TEMPERATURE
1514
AFTER TIME T_1
PROMPT USER TO CHANGE ATTACHMENT TO SPECIFIED ATTACHMENT
1516
PROMPT USER TO CHANGE GRIP TO SPECIFIED GRIP
1518
PROMPT USER TO CHANGE ARM POSITION TO SPECIFIED ARM POSITION
1520
ARM POSITION + GRIP OK + ATTACHMENT AFFIXED ?
1522
NO
YES
TO FIG. 46C

FIG. 46B

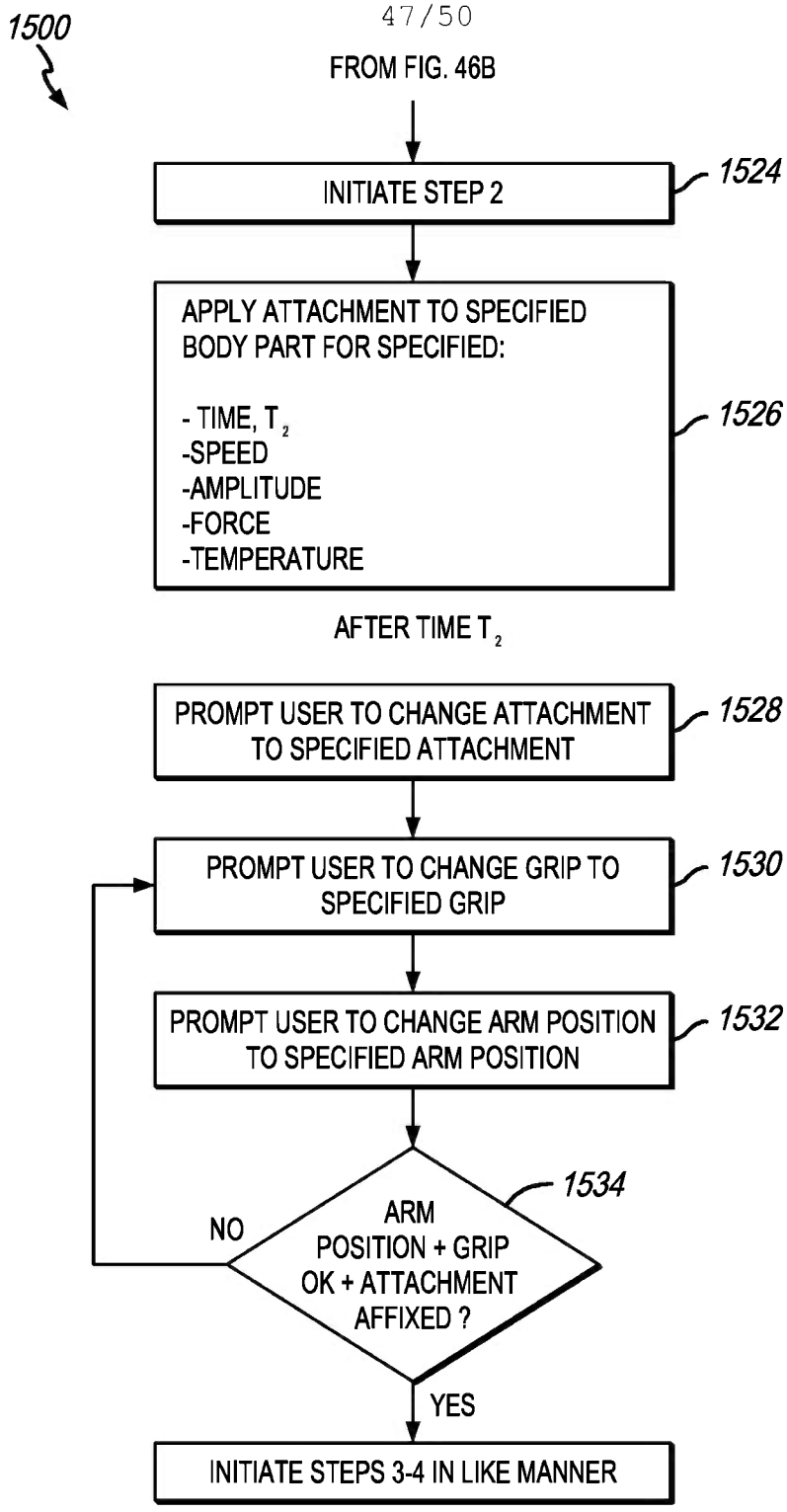

1500
FROM FIG. 46B
INITIATE STEP 2
1524
APPLY ATTACHMENT TO SPECIFIED BODY PART FOR SPECIFIED:
- TIME, T2
-SPEED
-AMPLITUDE
-FORCE
-TEMPERATURE
1526
AFTER TIME T2
PROMPT USER TO CHANGE ATTACHMENT TO SPECIFIED ATTACHMENT
1528
PROMPT USER TO CHANGE GRIP TO SPECIFIED GRIP
1530
PROMPT USER TO CHANGE ARM POSITION TO SPECIFIED ARM POSITION
1532
ARM POSITION + GRIP OK + ATTACHMENT AFFIXED ?
1534
NO
YES
INITIATE STEPS 3-4 IN LIKE MANNER

FIG. 46C

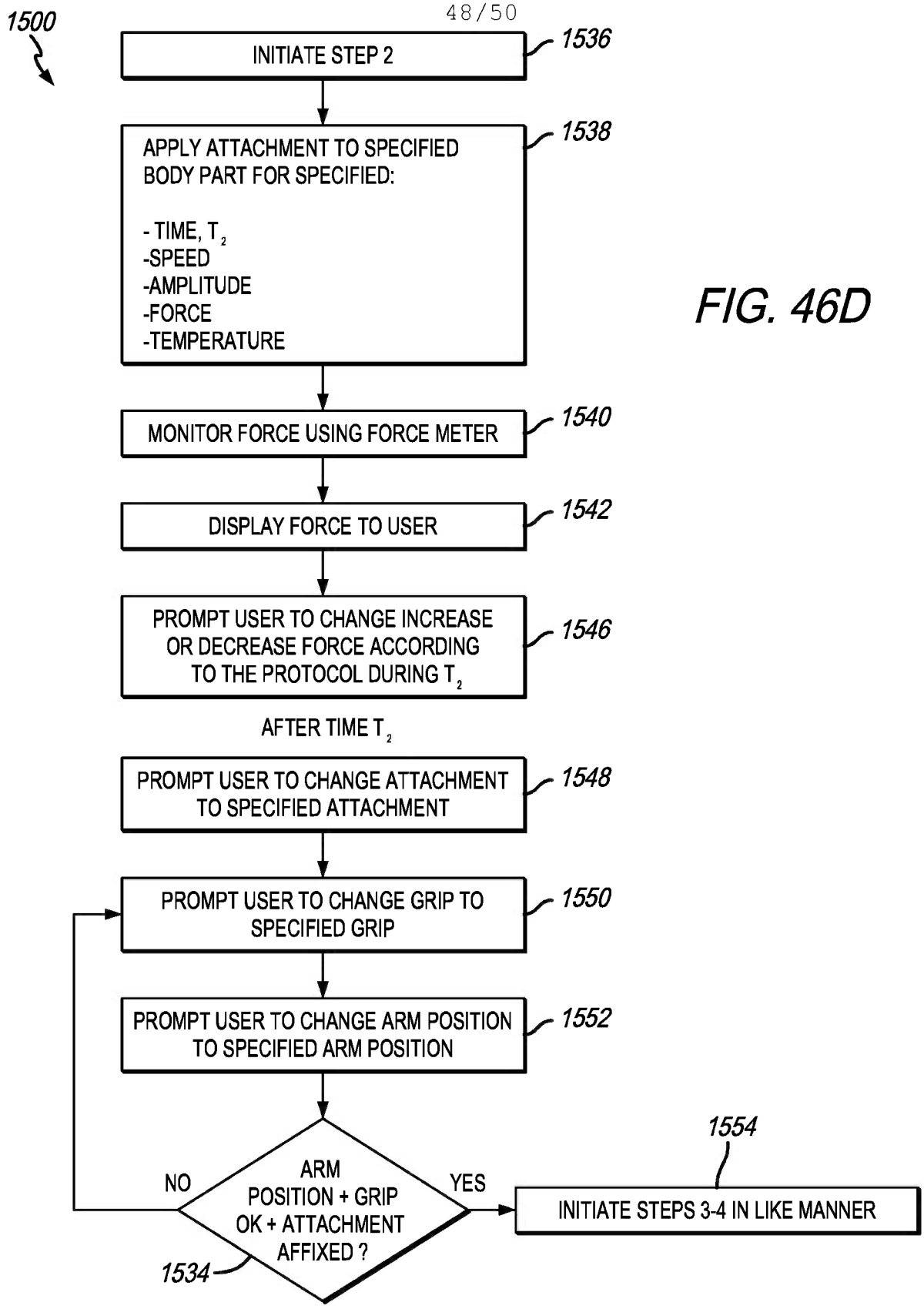

1500
INITIATE STEP 2
1536
APPLY ATTACHMENT TO SPECIFIED BODY PART FOR SPECIFIED:
- TIME, T_2
-SPEED
-AMPLITUDE
-FORCE
-TEMPERATURE
1538
MONITOR FORCE USING FORCE METER
1540
DISPLAY FORCE TO USER
1542
PROMPT USER TO CHANGE INCREASE OR DECREASE FORCE ACCORDING TO THE PROTOCOL DURING T_2
1546
AFTER TIME T_2
PROMPT USER TO CHANGE ATTACHMENT TO SPECIFIED ATTACHMENT
1548
PROMPT USER TO CHANGE GRIP TO SPECIFIED GRIP
1550
PROMPT USER TO CHANGE ARM POSITION TO SPECIFIED ARM POSITION
1552
ARM POSITION + GRIP OK + ATTACHMENT AFFIXED ?
1534
NO
YES
1554
INITIATE STEPS 3-4 IN LIKE MANNER

FIG. 46D

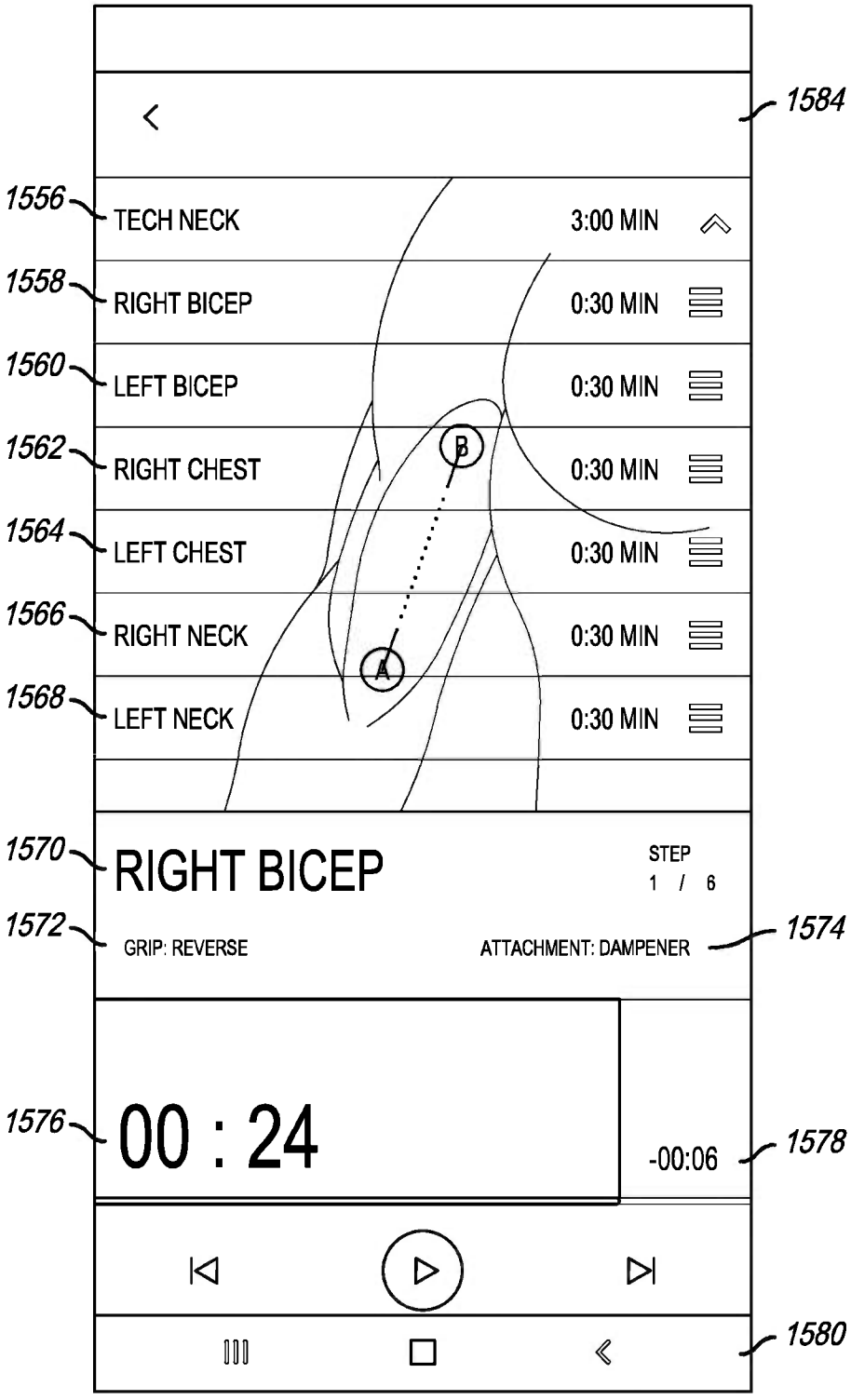

1584
1556
TECH NECK
3:00 MIN
1558
RIGHT BICEP
0:30 MIN
1560
LEFT BICEP
0:30 MIN
1562
RIGHT CHEST
0:30 MIN
1564
LEFT CHEST
0:30 MIN
1566
RIGHT NECK
0:30 MIN
1568
LEFT NECK
0:30 MIN
B
A
1570
RIGHT BICEP
STEP
1 / 6
1572
GRIP: REVERSE
ATTACHMENT: DAMPENER
1574
1576
00 : 24
-00:06
1578
1580

FIG. 47

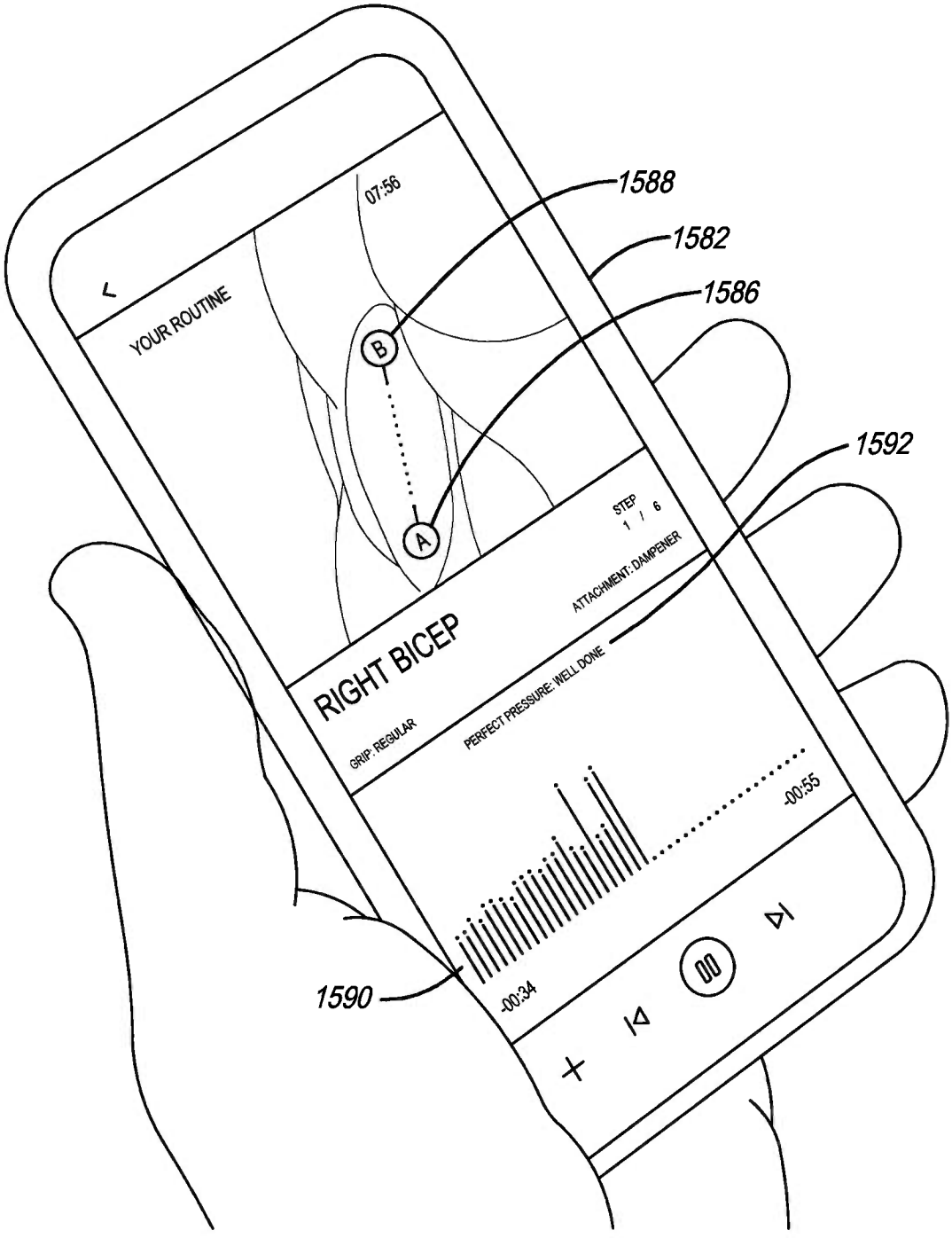

07:56
YOUR ROUTINE
B
A
1588
1582
1586
1592
STEP
1 / 6
ATTACHMENT: DAMPENER
RIGHT BICEP
GRIP: REGULAR
PERFECT PRESSURE: WELL DONE
-00:55
-00:34
1590

FIG. 48

PERCUSSIVE THERAPY DEVICE

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation-in-part of U.S. Patent Application No. 16/796,143, filed February 20, 2020, which claims the benefit of U.S. Provisional Application No. 62/844,424, filed May 7, 2019, U.S. Provisional Application No. 62/899,098, filed September 11, 2019 and U.S. Provisional Application No. 62/912,392, filed October 8, 2019. This application is also a continuation-in-part of U.S. Patent Application No. 16/675,772, filed November 6, 2019, which claims the benefit of U.S. Provisional Application No. 62/785,151, filed on December 26, 2018. All applications listed above are incorporated by reference herein in their entireties.

FIELD OF THE INVENTION

[0002] The present invention relates generally to massage devices and more particularly to a percussive therapy device that provides reciprocating motion.

BACKGROUND OF THE INVENTION

[0003] Massage devices often provide ineffective massages that are superficial and do not provide any real benefit. Accordingly, there is a need for an improved massage device. Furthermore, percussive massage devices are often used in an ineffective manner. Accordingly, there is a need for a percussive therapy device to be automated to provide effective massage or recovery.

SUMMARY OF THE PREFERRED EMBODIMENTS

[0004] In accordance with a first aspect of the present invention there is provided a percussive therapy or percussive massage device that includes a housing, an electrical source, a motor positioned in the housing, a switch for activating the motor, and a routine controller configured to initiate a protocol configured to apply at least one output of the percussive therapy device in response to user input, and initiate at least one step of the

protocol in which the percussive therapy device is applied in accordance with the at least one output. It will be appreciated that the terms percussive massage device and percussive therapy device are used interchangeably throughout. The terms are synonymous and generally have the same meaning. Commercial embodiments of the applicant's devices are generally being called percussive therapy devices in the market and therefore this term is used therein.

[0005] In a preferred embodiment, the at least one output comprises one or more of a time period the percussive therapy device is activated (either automatically or by the user turning it on and off via a prompt), a speed of an attachment of the percussive therapy device (either automatically or by the user switching from one speed to another via a prompt), a force applied by the attachment (by the user using the device), an amplitude of the attachment, and a temperature of the attachment.

[0006] In a preferred embodiment, the percussive therapy device includes a force meter configured to monitor and display a force applied by an attachment of the percussive therapy device. The display of the force is provided to a user and configured so that the user may adjust the force to correspond to a target force (which may be defined to include a target force range) to be applied during the at least one step of the protocol.

[0007] In a preferred embodiment, the percussive therapy device includes or is configured to communicated with an application (software application or app) configured to provide a user interface (e.g., on a user mobile device such as a phone or tablet). Preferably, the percussive therapy device includes a touch screen configured to provide or that does provide a user interface. In a preferred embodiment, a user is prompted to use a specified grip of the percussive therapy device (e.g., via the app visually, audibly or haptically, the touch screen on the percussive therapy device visually, audibly or haptically or via another screen or audible prompt).

[0008] In a preferred embodiment, a user is prompted (e.g., visually, audibly or haptically) to apply an attachment of the percussive therapy device to a specified body part. Preferably, the user is prompted (e.g., visually, audibly or haptically) to set an arm position of the percussive therapy device. The percussive therapy generally wherein a user is prompted through at least one of haptic feedback, sound, visual representation (e.g., a picture, graphic, etc.) and text during the at least one step to apply the at least one output. In a preferred embodiment, the user is prompted to move the attachment from a start point to an end point (e.g., visually, audibly or haptically) on a specified body part during the at least one step of the protocol.

[0009] In accordance with another aspect of the present invention there is provided a method of executing a routine for a percussive therapy device. The method includes initiating a protocol configured to apply at least one output of the percussive therapy device in response to user input; and executing at least one step of the protocol in which the percussive therapy device is applied in accordance with the at least one output. In a preferred embodiment, the at least one output includes one or more of a specified time period the percussive therapy device is activated (either automatically or by the user), a speed of an attachment of the percussive therapy device, a force of the attachment, an amplitude of the attachment, a type of attachment, a temperature of the attachment, an arm position of the percussive therapy device, and a grip of the percussive therapy device.

[0010] In a preferred embodiment, the method includes monitoring a force being applied by an attachment of the percussive therapy device; and displaying the force to a user. Preferably, the force is configured to be displayed to the user so that the user may adjust the force to correspond to a target force (which may be a range) predetermined by the at least one step of the protocol. Preferably, the user is prompted to apply one or more of the at least one output during the at least one step of the protocol. In a preferred embodiment,

the user input initiates the protocol via at least one of an application interface and a touch screen. In a preferred embodiment, the protocol is configured to provide therapeutic effect to one or more body parts of a user.

[0011] In accordance with another aspect of the present invention there is provided a method of executing a routine for a percussive therapy device that includes initiating a protocol configured to apply at least one output of the percussive therapy device in response to user input, and initiating at least one step of the protocol in which the percussive therapy device is applied in accordance with the at least one output. The at least one output comprises a time period the percussive therapy device is activated, a speed of an attachment of the percussive therapy device, an amplitude of the attachment, a force applied by the attachment, and a temperature applied by the attachment. The percussive therapy device is configured to provide a prompt to use a specified grip of the percussive therapy device and apply the attachment to a specified body part upon initiating the protocol, monitoring a measured force being applied by the attachment, and displaying the measured force to a user, wherein the measured force is configured to be displayed to the user so that the user may adjust an applied force to correspond to a target force predetermined by the at least one step of the protocol.

[0012] In a preferred embodiment, the user is prompted to set an arm position of the percussive therapy device, and/or the user is prompted to apply the attachment to a new specified body part during the at least one step of the protocol, and/or the user is prompted to affix a new attachment to the percussive therapy device during the at least one step of the protocol, and/or the user is prompted to move the attachment from one predetermined point of a body part to a second predetermined body part during the at least one step of the protocol.

[0013] In accordance with another aspect of the present invention there is provided a percussive therapy device that includes a housing, an electrical source, a motor positioned in the housing, a switch for activating the motor, and a push rod assembly operatively connected to the motor and configured to reciprocate in response to activation of the motor. In a preferred embodiment, the housing includes first, second and third handle portions and a head portion that cooperate to define a handle opening. The first handle portion defines a first axis, the second handle portion defines a second axis and the third handle portion defines a third axis and the first, second and third axes cooperate to form a triangle. The motor is positioned in the head portion of the housing, and at least a portion of the push rod assembly extends outside of the head portion. In a preferred embodiment the first handle portion is generally straight, the second handle portion is generally straight, and the third handle portion is generally straight.

[0014] In a preferred embodiment, the percussive therapy device incudes a wireless connection device (e.g., Bluetooth or the like) for connecting to a remote device. Remote means that any device separate from the percussive therapy device. The device does not need to be far away to be remote. Preferably, the electrical source is an optional rechargeable battery, and the percussive massage device further includes an optional wireless charging receiver that is in electrical communication with the battery. Preferably, the percussive therapy device includes and optional touchscreen.

[0015] In a preferred embodiment, the motor is a brushless motor, a motor mount is positioned in the housing, the motor is secured to the motor mount, and the motor mount is secured to the housing. Preferably, the motor mount includes first and second side walls that define a motor mount interior therebetween. The motor is secured to the first side wall and the second side wall is secured to the housing. In a preferred embodiment, the motor includes a motor shaft that extends through a protrusion opening defined in the first side

wall of the motor mount and into the motor mount interior, and at least a portion of the push rod assembly is positioned in the motor mount interior.

[0016] In a preferred embodiment, the percussive therapy device includes an attachment connected to a distal end of the push rod assembly, and a routine controller that is configured to initiate a protocol configured to provide user instructions to apply the attachment to a first body part for a first period of time along a first treatment path and to apply the attachment to the first or a second body part for a second period of a time along a second treatment path. Preferably, the user instructions are provided via a touch screen on the percussive therapy device or on an application on a remote electronic device. In a preferred embodiment, the percussive therapy device includes an attachment connected to a distal end of the push rod assembly, and a routine controller that is configured to initiate a protocol configured to provide user instructions to apply the attachment to a first body part for a first period of time and to apply the attachment to the first or a second body part for a second period of a time. The routine controller is configured to reciprocate the attachment at a first speed during the first period of time and at a second speed during the second period of time.

[0017] In a preferred embodiment, the percussive therapy device includes a routine controller that is configured to initiate a protocol to activate the motor for at least a first period of a time and a subsequent second period of time During the first period of time the routine controller is configured to provide first user instructions to perform a first task comprising at least one of treating a first body part, moving the attachment along a first treatment path, and connecting a first attachment to a distal end of the push rod assembly, and during the second period of time the routine controller is configured to provide second user instructions to perform a second task comprising at least one of treating a second body part, moving the attachment along a second treatment path, and connecting a second

attachment to the distal end of the push rod assembly. The first user instructions may also include instructions regarding grasping one of a first, second or third handle portion, and the second user instructions may also include instructions regarding grasping the same or another of the first, second or third handle portions. Preferably, the first and second user instructions are provided via a touch screen on the percussive therapy device or on an application on a remote electronic device. The first user instructions may also include instructions regarding applying a first target force (based on readings by the force meter), and the second user instructions may also include instructions regarding applying the first target force or a second target force (based on readings by the force meter).

[0018] In a preferred embodiment, the electrical source is a battery that is positioned in the second handle portion, and a wireless charging receiver that is in electrical communication with the battery is positioned in the third handle portion.

[0019] In accordance with another aspect of the present invention there is provided a method of using a percussive massage device that includes obtaining the percussive massage device that includes a housing having first, second and third handle portions that cooperate to define a handle opening, an electrical source, a motor positioned in the housing, a switch for activating the motor, and a push rod assembly operatively connected to the motor and configured to reciprocate in response to activation of the motor. The method also includes activating the motor using the switch, grasping the first handle portion, massaging a first body part, alternatively grasping the second handle portion and massaging the first body part, and alternatively grasping the third handle portion and massaging the first body part. In a preferred embodiment, the first handle portion defines a first axis, the second handle portion defines a second axis and the third handle portion defines a third axis, and the first, second and third axes cooperate to form a triangle. In a preferred embodiment, the method

also includes grasping the second handle portion, massaging a second body part, grasping the third handle portion, and massaging a third body part.

[0020] In accordance with another aspect of the present invention there is provided percussive massage device that includes a housing, an electrical source, a motor positioned in the housing, a switch for activating the motor, and a push rod assembly operatively connected to the motor and configured to reciprocate in response to activation of the motor. In a preferred embodiment, the housing includes first, second and third handle portions that cooperate to define a handle opening, wherein the first handle portion defines a first axis, the second handle portion defines a second axis and the third handle portion defines a third axis, and wherein the first, second and third axes cooperate to form a triangle.

[0021] Preferably, the first handle portion includes a first handle portion interior edge and defines a first handle portion length and the first handle portion length is long enough that when a user grasps the first handle portion with a hand at least a portion of three fingers extend through the handle opening and contact the first handle portion interior edge. Preferably, the second handle portion includes a second handle portion interior edge and defines a second handle portion length and the second handle portion length is long enough that when a user grasps the second handle portion with a hand at least a portion of three fingers extend through the handle opening and contact the second handle portion interior edge. Preferably, the third handle portion includes a third handle portion interior edge and defines a third handle portion length and the third handle portion length is long enough that when a user grasps the third handle portion with a hand at least a portion of three fingers extend through the handle opening and contact the third handle portion interior edge. In a preferred embodiment, the first handle portion is generally straight, the second handle portion is generally straight and the third handle portion is generally straight. Generally

straight means that the majority of the handle portion is straight, but can include rounded edges or corners where the different handle portions meet or where the handle portions meet the bulge portion or the finger protrusion, etc.

[0022] In a preferred embodiment, the switch includes switch electronics associated therewith, the electrical source is a battery that is housed in the second handle portion and the switch electronics are housed in the first handle portion. Preferably, the motor is configured to rotate a pinion shaft having a pinion gear thereon about a shaft rotation axis. The housing includes a gear member disposed therein that is operatively engaged with the pinion gear and rotates about a gear rotation axis. The push rod assembly is operatively connected to the gear member, and rotational motion of the pinion shaft is converted to reciprocating motion of the push rod assembly through the engagement of the pinion gear and the gear member. The motor includes a motor shaft extending outwardly therefrom and a pinion coupling assembly is positioned between the motor shaft and the pinion shaft. The pinion coupling includes a lower connector that is operatively connected to the motor shaft, an upper connector that is operatively connected to the pinion shaft, and a cross coupling positioned between the lower connector and the upper connector. In a preferred embodiment, the lower connector includes a main body portion that defines a central opening that receives the motor shaft and first and second lower connector arms extending outwardly from the main body portion, the upper connector includes a main body portion that defines a central opening that receives the pinion shaft and first and second upper connector arms extending outwardly from the main body portion, the cross coupling includes radially extending ribs, and the first and second lower connector members and the first and second upper connector members operatively engage the radially extending ribs. Preferably, the lower and upper connectors comprise a plastic and the cross coupling comprises an elastomer.

[0023] In a preferred embodiment, the gear member is disposed in a rotation housing that is rotatable between at least first and second positions. A gearbox housing that houses the gear member is disposed in the rotation housing. The gearbox housing includes a clearance slot having first and second ends defined therein. The push rod assembly extends through the clearance slot, such that when the rotation housing is rotated from the first position to the second position the push rod assembly moves within the clearance slot from adjacent the first end to adjacent the second end.

[0024] In a preferred embodiment, the push rod assembly includes a first rod portion having a proximal end and a distal end and a second rod portion having a proximal end and a distal end. The proximal end of the first rod portion is operatively connected to the motor. An adapter assembly is positioned between the first and second rod portions. The adapter assembly allows the first rod portion to pivot with respect to the second rod portion. Preferably, the adapter assembly includes an adapter member that includes a pocket that receives the distal end of the first rod portion therein. A pivot pin spans the pocket and extends through the distal end of the first rod portion. In a preferred embodiment, the adapter member includes a protrusion that is received in the proximal end of the second rod portion.

[0025] In accordance with another aspect of the present invention there is provided a massage device that includes a housing, an electrical input, a motor, a switch in electrical communication with the electrical input and the motor and configured to selectively provide power from the electrical input to the motor, an actuated output operatively connected to the motor and configured to reciprocate in response to activation of the motor, and a treatment structure operatively connected to a distal end of the actuated output. The actuated output is configured to reciprocate the treatment structure at a frequency of between about 15 Hz and about 100 Hz, and at an amplitude of between

about 0.15 and about 1.0 inches. The combination of amplitude and frequency provides efficient reciprocation of the treatment structure such that the treatment structure provides therapeutically beneficial treatment to a targeted muscle of a user.

[0026] In a preferred embodiment, the actuated output is configured to reciprocate the treatment structure at a frequency of between about 25 Hz and about 48 Hz, and at an amplitude of between about 0.23 and about 0.70 inches. In another preferred embodiment, the actuated output is configured to reciprocate the treatment structure at a frequency of between about 33 Hz and about 42 Hz, and at an amplitude of between about 0.35 and about 0.65 inches.

[0027] In accordance with another aspect of the present invention there is provided a percussive massage device with a force meter that includes a housing, an electrical source, a motor positioned in the housing, a switch for activating the motor, and a controller configured to obtain a voltage of the motor, generate a lookup table correlating voltage to force applied by the percussive massage device, and display a force magnitude corresponding to the obtained voltage using the lookup table. In a preferred embodiment, the lookup table is generated by determining a maximum magnitude of force configured to be applied by the percussive massage device, determining a maximum magnitude of voltage configured to be applied to the percussive massage device from a power source, dividing the maximum magnitude of force into equal force increments, and dividing the maximum magnitude of voltage into equal voltage increments. The number of equal force increments and the number of equal voltage increments is the same. Preferably, the percussive massage device includes a battery pack and a display configured to depict an amount of force applied by the percussive massage device. In a preferred embodiment, the display includes a series of LEDs. In a preferred embodiment, the percussive massage device includes an organic light-emitting diode screen.

[0028] In a preferred embodiment, the motor is a brushless direct-current (BLDC) motor. Preferably, the percussive massage device includes a voltage-sensing resistor electrically coupled to the BLDC motor and the controller.

[0029] In accordance with another aspect of the present invention there is provided a method of displaying force of a percussive massage device that includes obtaining a voltage of a motor of the percussive massage device, generating a lookup table correlating voltage to force applied by the percussive massage device, and displaying a force magnitude corresponding to the obtained voltage using the lookup table. In a preferred embodiment, the lookup table correlating voltage to force is linear. Preferably, the lookup table is generated by determining a maximum magnitude of force configured to be applied by the percussive massage device, determining a maximum magnitude of voltage configured to be applied to the percussive massage device from a power source, dividing the maximum magnitude of force into equal force increments, and dividing the maximum magnitude of voltage into equal voltage increments, wherein the number of equal force increments and the number of equal voltage increments is the same.

[0030] In a preferred embodiment, the method includes obtaining a maximum power source voltage of the percussive massage device, setting the maximum power source voltage to be the maximum magnitude of voltage, dividing the maximum magnitude of voltage into equal voltage increments, wherein the number of equal force increments and the number of equal voltage increments is the same, generating an updated lookup table correlating voltage to force applied by the percussive massage device corresponding to the range of voltages determined by the maximum power source voltage, and displaying a calibrated force magnitude corresponding to the power source voltage using the updated lookup table. In a preferred embodiment, the method includes obtaining at least two power source voltages each corresponding to a magnitude of force, wherein the magnitude of force is

determined from the displayed force magnitude, measuring a magnitude of force exerted by the percussive massage device using an external force meter for each of the at least two power source voltages, and generating an updated lookup table correlating voltage to force applied by the percussive massage device corresponding to the measured magnitudes of force.

[0031] In a preferred embodiment, the method includes displaying a calibrated force magnitude corresponding to the measured magnitudes of force using the updated lookup table. Preferably, the lookup table is updated for each magnitude of force capable of being displayed on the percussive massage device.

[0032] In accordance with another aspect of the present invention there is provided a method of displaying force of a percussive massage device that includes obtaining a current magnitude of a battery pack of the percussive massage device, obtaining a voltage magnitude of the battery pack, determining a power magnitude using the current magnitude and voltage magnitude of the battery pack, generating a lookup table correlating power magnitude to force magnitude applied by the percussive massage device, and displaying a force magnitude corresponding to the obtained power magnitude using the lookup table. In a preferred embodiment, the force magnitude is displayed utilizing a series of LEDs which are activated corresponding with the force magnitude. Preferably, the lookup table is generated by determining a maximum power magnitude to be input into the percussive massage device, determining a minimum power magnitude of the percussive massage device when no load is applied to the percussive massage device, determining a maximum force magnitude configured to be applied to the percussive massage device from a power source, dividing the maximum power magnitude into equal power increments, and dividing the maximum force magnitude into equal force increments. The number of equal power increments and the number of equal force increments is the same. Preferably, the

maximum power magnitude is a maximum effective power magnitude derived from a total effective power.

[0033] In a preferred embodiment, the method includes determining at least two power magnitudes using current and voltage measurements of the battery pack, each corresponding to a magnitude of force. The magnitude of force is determined from the displayed force magnitude. Measuring a magnitude of force exerted by the percussive massage device using an external force meter for each of the at least two power magnitudes, and generating an updated lookup table correlating power to force applied by the percussive massage device corresponding to the measured magnitudes of force. In a preferred embodiment, the method includes displaying a calibrated force magnitude corresponding to the measured magnitudes of force using the updated lookup table. Preferably, the lookup table is updated for each magnitude of force capable of being displayed on the percussive massage device.

[0034] It will be appreciated that the inventive features discussed herein can be used with any type of percussive massage device. For example, the force meter and other features taught herein can be used with the percussive massage device disclosed in U.S. Patent No. 10,357,425 ("the '425 patent"), the entirety of which is incorporated herein by reference.

[0035] In an embodiment, a non-transitory computer-readable medium has stored thereon software instructions that, when executed by a processor, cause the processor to obtain a voltage of a motor of the percussive massage device, generate a lookup table correlating voltage to force applied by the percussive massage device, and display a force magnitude corresponding to the obtained voltage using the lookup table.

[0036] In an embodiment, the lookup table is generated by determining a maximum magnitude of force configured to be applied by the percussive massage device, determining a maximum magnitude of voltage configured to be applied to the percussive

massage device from a power source, dividing the maximum magnitude of force into equal force increments, and dividing the maximum magnitude of voltage into equal voltage increments. In an embodiment, the number of equal force increments and the number of equal voltage increments is the same.

[0037] In another embodiment, a non-transitory computer-readable medium has stored thereon software instructions that, when executed by a processor, cause the processor to obtain a maximum power source voltage of the percussive massage device, set the maximum power source voltage to be the maximum magnitude of voltage, and divide the maximum magnitude of voltage into equal voltage increments, generate an updated lookup table correlating voltage to force applied by the percussive massage device corresponding to the range of voltages determined by the maximum power source voltage, and display a calibrated force magnitude corresponding to the power source voltage using the updated lookup table.

[0038] In another embodiment, a non-transitory computer-readable medium has stored thereon software instructions that, when executed by a processor, cause the processor to obtain at least two power source voltages each corresponding to a magnitude of force, wherein the magnitude of force is determined from the displayed force magnitude, measure a magnitude of force exerted by the percussive massage device using an external force meter for each of the at least two power source voltages; and generate an updated lookup table correlating voltage to force applied by the percussive massage device corresponding to the measured magnitudes of force.

[0039] In an embodiment, a non-transitory computer-readable medium has stored thereon software instructions that, when executed by a processor, cause the processor to obtain a current magnitude of a battery pack of the percussive massage device, obtain a voltage magnitude of the battery pack, determine a power magnitude using the current magnitude

and voltage magnitude of the battery pack, generate a lookup table correlating power magnitude to force magnitude applied by the percussive massage device, and display a force magnitude corresponding to the obtained power magnitude using the lookup table.

[0040] In an embodiment, a non-transitory computer-readable medium has stored thereon software instructions that, when executed by a processor, cause the processor to determine at least two power magnitudes using current and voltage measurements of the battery pack, each corresponding to a magnitude of force, wherein the magnitude of force is determined from the displayed force magnitude, measure a magnitude of force exerted by the percussive massage device using an external force meter for each of the at least two power magnitudes, and generate an updated lookup table correlating power to force applied by the percussive massage device corresponding to the measured magnitudes of force.

[0041] In a preferred embodiment, the motor, in one embodiment, converts power from the power source into motion. In some embodiments, the motor is an electric motor. The electric motor may be any type of electric motor known in the art, including, but not limited to, a brushed motor, a brushless motor, a direct current (DC) motor, an alternating current (AC) motor, a mechanical-commutator motor, an electronic commutator motor, or an externally commutated motor.

[0042] In some embodiments, the actuated output or output shaft reciprocates at a rate of approximately 65 Hz. The actuated output, in some embodiments, reciprocates at a rate over 50 Hz. The reciprocating treatment device, in some embodiments, provides reciprocation at a rate ranging between 50 Hz and 80 Hz. In some embodiments, the actuated output has a maximum articulation rate of between 50 Hz and 80 Hz. In another embodiment, the actuated output has an articulation rate of between 30 Hz and 80 Hz. In certain embodiments, the actuated output has an articulation rate of approximately 37 Hz. In one embodiment, the actuated output has an articulation rate of approximately 60 Hz. In

a preferred embodiment, the actuated output articulates or reciprocates at a frequency of between about 15 Hz and about 100 Hz. In a more preferred embodiment, the actuated output articulates or reciprocates at a frequency of between about 25 Hz and about 48 Hz. In the most preferred embodiment, the actuated output articulates or reciprocates at a frequency of between about 33 Hz and about 42 Hz. Any chosen range within the specified ranges is within the scope of the present invention.

[0043] The actuated output may move through a predetermined range of reciprocation. For example, the actuated output may be configured to have an amplitude of one half inch. In another embodiment, the actuated output may be configured to have an amplitude of one quarter inch. As will be appreciated by one skilled in the art, the actuated output may be configured to have any amplitude deemed therapeutically beneficial.

[0044] In some embodiments, the actuated output may be adjustable through a variable range of reciprocation. For example, the reciprocating treatment device may include an input to adjust the reciprocation amplitude from one quarter of an inch through a range of up to one inch. In a preferred embodiment, the actuated output moves through an amplitude of between about 0.15 inches and about 1.0 inches. In a more preferred embodiment, the actuated output articulates or reciprocates at a frequency of between about 0.23 inches and about 0.70 inches. In the most preferred embodiment, the actuated output articulates or reciprocates at a frequency of between about 0.35 inches and about 0.65 inches. Any chosen range within the specified ranges is within the scope of the present invention.

[0045] It will be appreciated that the device operates most effectively within the combined frequency and amplitude ranges. When developing the invention, the inventor determined that if the frequency and amplitude are above the ranges set forth above the device can cause pain and below the ranges the device is ineffective and does not provide effective

therapeutic relief or massage. Only when the device operates within the disclosed combination of frequency and amplitude ranges does it provide efficient and therapeutically beneficial treatment to the muscles targeted by the device.

[0046] In certain embodiments, the reciprocating treatment device includes one or more components to regulate the articulation rate of the actuated output in response to varying levels of power provided at the power input. For example, the reciprocating treatment device may include a voltage regulator (not shown) to provide a substantially constant voltage to the motor over a range of input voltages. In another embodiment, the current provided to the motor may be regulated. In some embodiments, operation of the reciprocating treatment device may be restricted in response to an input voltage being below a preset value.

[0047] In a preferred embodiment, the percussive massage device includes a brushless motor. It will be appreciated that the brushless motor does not include any gears and is quieter than geared motors.

[0048] The device includes a push rod or shaft that is connected directly to the motor by a pin. In a preferred embodiment, the push rod is L-shaped or includes an arc shape. Preferably, the point where the push rod is connected to the pin is offset from reciprocating path that the distal end 40 of the push rod (and the massage attachment) travel. This capability is provided by the arc or L-shape. It should be appreciated that the push rod is designed such that it can transmit the force diagonally instead of vertically so the motor can be located at or near the middle of the device, otherwise a protrusion would be necessary to keep the shaft in the center with the motor offset therefrom (and positioned in the protrusion). The arc also allows the push rod to have a close clearance with the motor and allows the outer housing to be smaller than similar prior art devices, therefore making the device lower profile. Preferably two bearings are included at the proximal end of the

push rod where it connects to the motor to counteract the diagonal forces and preventing the push rod for moving and touching the motor.

[0049] In a preferred embodiment, the device includes a touch screen for stopping, starting, activating, etc. The touch screen can also include other functions. Preferably, the device includes a thumbwheel or rolling button positioned near the touch screen/on off button to allow the user to scroll or navigate through the different functions. Preferably, the device also includes variable amplitude or stroke. For example, the stroke can change or be changed between about 8-16 mm.

[0050] In a preferred embodiment, the device is associated with and can be operated by an app or software that runs on a mobile device such as a phone, watch or tablet (or any computer). The app can connect to the device via bluetooth or other connection protocol. The app can have any or all of the following functions. Furthermore, any of the functions discussed herein can be added to the touch screen/scroll wheel or button(s) capability directly on the device. If the user walks or is located too far away from the device, the device will not work or activate. The device can be turned on an off using the app as well as the touch screen or button on the device. The app can control the variable speeds (e.g., anywhere between 1750-3000 RPM). A timer so the device stops after a predetermined period of time. The app can also include different treatment protocols associated therewith. This will allow the user to choose a protocol or area of the body they want to work on. When the start of the protocol is selected, the device will run through a routine. For example, the device may run at a first RPM for a first period of time and then run at a second RPM for a second period of time and/or at a first amplitude for a first period of time and then run at a second amplitude for a second period of time. The routines can also include prompts (e.g., haptic feedback) for letting the user to know to move to a new body part. These routines or treatments can be related to recovery, blood flow increase,

performance, etc. and can each include a preprogrammed routine. The routines can also prompt or instruct the user to switch treatment structures (AmpBITS) or positions of the arm or rotation head. The prompts can include sounds, haptic feedback (e.g., vibration of the device or mobile device), textual instructions on the app or touch screen, etc. For example, the app may instruct the user to start with the ball treatment structure with the arm in position two. Then the user hits start and the device runs at a first frequency for a predetermined amount of time. The app or device then prompts the user to begin the next step in the routine and instructs the user to change to the cone treatment structure and to place the arm in position 1. The user hits start again and the device runs at a second frequency for a predetermined amount of time.

[0051] In a preferred embodiment, the app includes near field communication ("NFC") capability or other capability that allows the user's mobile device with the app thereon to scan an identifier, such as a barcode or a QR code that prompts the app to display certain information, such as the routines discussed above. In use, a user will be able to tap or place their mobile device near an NFC tag (or scan a QR code) on a piece of gym equipment and the app will show instructions, content or a lesson that is customized for using the device with that piece of equipment. For example, on a treadmill, the user scans the QR code or NFC tag and the app recognizes that the user is about to use the treadmill. The app can then provide instructions for how to use the device in conjunction with the treadmill and can initiate a preprogrammed routine for using the treadmill. For example, the user can be instructed to start with the left quad. Then, after a predetermined period of time (e.g., 15 seconds), the device, or the mobile device that includes the app software thereon, vibrates or provides other haptic feedback. The user then switches to their left quad and after a predetermined period of time the device again vibrates. The user can then begin using the treadmill. Any routine is within the scope of the present invention. In an embodiment, the

device and/or app (i.e., the mobile device containing the app) can also communicate (via bluetooth or the like) with the gym equipment (e.g., treadmill).

[0052] The device can also include a torque or force meter to let the user know how much force they are applying. The display associated with the force meter shows how much force is being applied on the muscle. The force meter allows for a more precise and effective treatment. The device includes a torque measuring sensor and display. Depending on the muscle the device is being used on and the benefit the user is looking to get (prepare, perform, recover) the force that should be applied varies. By having a torque sensor, the user is able to get a more precise and personalized treatment. The app and the touchscreen can provide the force information to the user. The force meter can be integrated with the routines and the user can be provided feedback with whether they are applying too much or too little pressure. The device can also include a thermal sensor or thermometer that can determine the temperature of the user's muscle and to provide feedback to the device and/or app. The haptic feedback can also provide feedback for too much pressure or force.

[0053] In a preferred embodiment, the percussive massage device includes a motor mount for mounting the brushless motor within the housing and for distributing forces from the motor as it operates to the housing. The motor is secured to a first side of the motor mount and the second or opposing side of the motor mount is secured to the housing. The motor mount includes a plurality of arms that space the motor from the housing and define a reciprocation space in which the push rod and associated components (counterweight, etc.) reciprocate. Threaded fasteners connect the motor mount to the housing. In a preferred embodiment, dampening members or feet are received on the shaft of the threaded fastener. The dampening members each include an annular slot defined therein. The annular slots receive housing. This prevents direct contact of the threaded fasteners with

the housing and reduces sound from vibrations. The threaded fasteners are received in openings in tabs at the end of the arms.

[0054] In a preferred embodiment, the motor is housed in a motor housing that is rotatable within the main housing. The motor housing is basically the equivalent of the gear box housing in related embodiments. In a preferred embodiment, there are opposite openings in the outside of the motor housing that expose the motor on one side and the motor mount on the other. The openings provide ventilation for the motor and allow the motor mount to connect directly to the main housing.

[0055] In a preferred embodiment, the device includes a touch screen as well as button(s) for operating the device. For example, the device can include a touch screen, a center button for turning the device on and off and a ring/rocker button that provides the ability to scroll left and right (e.g., to the preset treatments discussed herein) and up and down (e.g., to control the speed or frequency). The screen can also be a non-touch screen.

[0056] In another preferred embodiment, any of the devices taught herein can include the ability to vary the amplitude, thus providing a longer or shorter stroke depending on the application or needs of the user. The amplitude variability can also be part of the routines or presets discussed herein. For example, the device can include a mechanical switch that allows the eccentricity of the connector to be modified (e.g., between 4mm and 8mm). The mechanism can include a push button and a slider. The pin structure has a spring that lets it fall back into the locked position.

[0057] In a preferred embodiment, the device includes a touch screen for stopping, starting, activating, etc. The touch screen can also include other functions. Preferably, the device includes a thumbwheel or rolling button positioned near the touch screen/on off button to allow the user to scroll or navigate through the different functions.

BRIEF DESCRIPTION OF THE DRAWINGS

[0058] The invention may be more readily understood by referring to the accompanying drawings in which:

[0059] FIG. 1 is a side elevational view of a percussive massage device in accordance with a preferred embodiment of the present invention;

[0060] FIG. 1A is another side elevational view of the percussive massage device of FIG. 1;

[0061] FIG. 2 is a perspective view of the percussive massage device;

[0062] FIG. 3 is a side elevational view of the percussive massage device showing a user grasping the first handle portion;

[0063] FIG. 4 is a side elevational view of the percussive massage device showing a user grasping the third handle portion;

[0064] FIG. 5 is a side elevational view of the percussive massage device showing a user grasping the second handle portion;

[0065] FIG. 6 is an exploded perspective view of the percussive massage device;

[0066] FIG. 7 is an exploded perspective view of a portion of the drive train components of the percussive massage device;

[0067] FIG. 8 is another an exploded perspective view of a portion of the percussive massage device;

[0068] FIG. 9 is a perspective view of the drive train components of the percussive massage device;

[0069] FIG. 10 is a perspective view of the push rod assembly of the percussive massage device;

[0070] FIG. 11 is a perspective view of another percussive massage device;

[0071] FIG. 12 is a side elevational view of the percussive massage device of FIG. 11;

[0072] FIG. 13 is a side elevational view of the percussive massage device showing some internal components in hidden lines;

[0073] FIG. 14 is an exploded perspective view of some of the internal components of the percussive massage device;

[0074] FIG. 15 is a perspective view of another percussive massage device; and

[0075] FIG. 16 is a side elevational view of the percussive massage device of FIG. 15.

[0076] FIG. 17 is a block diagram showing interconnected components of a percussive massage device with a force meter;

[0077] FIG. 18 is a circuit diagram of a microcontroller unit with pin outputs in accordance with one embodiment;

[0078] FIG. 19 is a circuit diagram used for battery voltage detection in accordance with one embodiment;

[0079] FIG. 20 is a circuit diagram for detection and measurement of voltage of the motor of the percussive massage device in accordance with one embodiment;

[0080] FIG. 21 is a flow diagram showing a method of detecting force applied by the percussive massage device in accordance with a preferred embodiment;

[0081] FIG. 22 is a flow diagram showing a method of generating a lookup table correlating voltage to force in accordance with a preferred embodiment;

[0082] FIG. 23 is a graph plotting a lookup table for use by a method of detecting force applied by the percussive massage device that was generated by correlating voltage to force in accordance with a preferred embodiment;

[0083] FIG. 24 is a flow diagram showing a method of calibrating a lookup table according to a preferred embodiment;

[0084] FIG. 25 is a graph plotting a lookup table generated by a method of detecting force applied by the percussive massage device against a lookup table calibrated by using a method of calibrating a lookup table according to a preferred embodiment;

[0085] FIG. 26 is a flow diagram showing a method of calibrating a lookup table;

[0086] FIG. 27 is a graph plotting a lookup table after being calibrated in accordance with a preferred embodiment;

[0087] FIG. 28 is a flow diagram showing a method of detecting force applied by a percussive massage device in accordance with a preferred embodiment;

[0088] FIG. 29 is a flow diagram showing a method of generating a lookup table correlating power to force in accordance with a preferred embodiment;

[0089] FIG. 30 is a graph plotting a lookup table for use by a method of detecting force of that was generated by correlating power to force in accordance with a preferred embodiment;

[0090] FIG. 31 is a flow diagram showing a method of calibrating a lookup table in accordance with a preferred embodiment;

[0091] FIG. 32 is a graph plotting a lookup table after being calibrated in accordance with a preferred embodiment;

[0092] FIG. 33 is a perspective view of a percussive massage device in accordance with a preferred embodiment of the present invention;

[0093] FIG. 34 is a perspective view of the percussive massage device of FIG. 13 with a portion of the housing removed;

[0094] FIG. 35 is a perspective view of the motor;

[0095] FIG. 36 is a side elevational view of the percussive massage device in accordance with a preferred embodiment of the present invention;

[0096] FIG. 37 is another side elevational view of the percussive massage device;

[0097] FIG. 38 is a side elevational view of the percussive massage device showing a user grasping the first handle portion;

[0098] FIG. 39 is a side elevational view of the percussive massage device showing a user grasping the third handle portion;

[0099] FIG. 40 is a side elevational view of the percussive massage device showing a user grasping the second handle portion;

[00100] FIG. 41 is a perspective view of the percussive massage device of FIG. 18 with a portion of the housing removed;

[00101] FIGS. 42A and 42B are cross sectional views of the head portion and motor;

[00102] FIG. 43 is an exploded view of some of the internal components of percussive massage device of FIG. 33;

[00103] FIG. 43A is an exploded view of the motor and motor mount;

[00104] FIG. 44 is a chart showing steps of Protocol 1 in accordance with a method of performing a routine for a percussive massage device;

[00105] FIG. 45 is a chart showing steps of a "Shin Splints" protocol in accordance with a method of performing a routine for a percussive massage device;

[00106] FIGS. 46A, 46B, 46C, and 46D are methods of performing a routine for a percussive massage device;

[00107] FIG. 47 is a front view of a graphical user interface showing a "Tech Neck" protocol; and

[00108] FIG. 48 is a front view of a graphical user interface showing a "Right Bicep" protocol.

[00109] Like numerals refer to like parts throughout the several views of the drawings.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[00110] The following description and drawings are illustrative and are not to be construed as limiting. Numerous specific details are described to provide a thorough understanding of the disclosure. However, in certain instances, well-known or conventional details are not described in order to avoid obscuring the description. References to one or another embodiment in the present disclosure can be, but not necessarily are, references to the same embodiment; and, such references mean at least one of the embodiments.

[00111] Reference in this specification to "one embodiment" or "an embodiment" means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment of the disclosure. Appearances of the phrase "in one embodiment" in various places in the specification do not necessarily refer to the same embodiment, nor are separate or alternative embodiments mutually exclusive of other embodiments. Moreover, various features are described which may be exhibited by some embodiments and not by others. Similarly, various requirements are described which may be requirements for some embodiments but not other embodiments.

[00112] The terms used in this specification generally have their ordinary meanings in the art, within the context of the disclosure, and in the specific context where each term is used. Certain terms that are used to describe the disclosure are discussed below, or elsewhere in the specification, to provide additional guidance to the practitioner regarding the description of the disclosure. For convenience, certain terms may be highlighted, for example using italics and/or quotation marks: The use of highlighting has no influence on the scope and meaning of a term; the scope and meaning of a term is the same, in the same context, whether or not it is highlighted. It will be appreciated that the same thing can be said in more than one way.

[00113] Consequently, alternative language and synonyms may be used for any one or more of the terms discussed herein. Nor is any special significance to be placed upon whether or

not a term is elaborated or discussed herein. Synonyms for certain terms are provided. A recital of one or more synonyms does not exclude the use of other synonyms. The use of examples anywhere in this specification including examples of any terms discussed herein is illustrative only, and is not intended to further limit the scope and meaning of the disclosure or of any exemplified term. Likewise, the disclosure is not limited to various embodiments given in this specification.

[00114] Without intent to further limit the scope of the disclosure, examples of instruments, apparatus, methods and their related results according to the embodiments of the present disclosure are given below. Note that titles or subtitles may be used in the examples for convenience of a reader, which in no way should limit the scope of the disclosure. Unless otherwise defined, all technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this disclosure pertains. In the case of conflict, the present document, including definitions, will control.

[00115] It will be appreciated that terms such as "front," "back," "top," "bottom," "side," "short," "long," "up," "down," and "below" used herein are merely for ease of description and refer to the orientation of the components as shown in the figures. It should be understood that any orientation of the components described herein is within the scope of the present invention.

[00116] While many embodiments are described herein, at least some of the described embodiments provide an apparatus, system, and method for a reciprocating treatment device.

[00117] FIGS. 1-10 show an embodiment of a percussive massage device 212 that includes a rechargeable battery (and replaceable or removable battery) 114. Device 212 is referred to commercially as the G3PRO. As shown in FIGS. 1-1A, in a preferred embodiment, the percussive massage device 212 includes three handle portions (referred to herein as first

handle portion 143, second handle portion 145 and third handle portion 147) that cooperate to define a central or handle opening 149. All of the handle portions are long enough that they are configured such that a person can grasp that particular handle portion to utilize the device. The ability to grasp the different handle portions allows a person (when using the device on their own body) to use the device on different body parts and from different angles, thus providing the ability to reach body parts, such as the back, that might not be possible without the three handle portions.

[00118] As shown in FIG. 1, the first handle portion 143 defines a first handle portion axis A1, the second handle portion 145 defines a second handle portion axis A2 and the third handle portion 147 defines a third handle portion axis A3 that cooperate to form a triangle. In a preferred embodiment, the battery 114 is housed in the second handle portion 145 and the motor 106 is housed in the third handle portion 147.

[00119] FIGS. 3-5 show a user's hand grasping the various handle portions. The length of each of the first, second and third handle portions is long enough so that a person with a large hand can comfortably grasp each handle portion with at least three to four fingers extending through the handle opening, as shown in FIGS. 3-5. In a preferred embodiment, the first handle portion 143 has an interior edge 143a, the second handle portion 145 has an interior edge 145a and the third handle portion 147 has an interior edge 147a, which all cooperate to at least partially define the handle opening 149. As shown in FIG. 1, in a preferred embodiment, the first handle portion 143 includes a finger protrusion 151 that includes a finger surface 151a that extends between the interior edge 143a of the first handle portion and the interior edge 147a of the third handle portion 147 and at least partially defines the handle opening 149. As shown in FIG. 3, in use, a user can place their index finger against the finger surface 151a. The finger protrusion and surface provide a feedback point or support surface such that when a user places their index finger against

the surface it helps the user with control and comfort of using the device. In a preferred embodiment, at least a portion of the finger surface 151a is straight, as shown in FIG. 1 (as opposed to the other "corners" of the handle opening 149 being rounded).

[00120] FIG. 1A shows the preferred dimensions of the interior surfaces of the handle opening 149. It will be appreciated that the interior surfaces comprise a series of flat and curved surfaces. H1 is the dimension of the interior edge 143a of the first handle portion 143 (the first handle portion length). H2 is the dimension of the interior edge 145a of the second handle portion 145 f(the second handle portion length). H3 is the dimension of the interior edge 147a of the third handle portion 147 (the third handle portion length). H4 is the dimension of the finger surface 151a (the finger protrusion length). R1 is the dimension of the radius between interior edges 143a and 145a and R2 is the dimension of the radius between interior edges 145a and 147a. In a preferred embodiment, H1 is about 94 mm, H2 is about 66 mm, H3 is about 96 mm, H4 is about 12 mm, R1 is about 6.5 mm and R2 is about 6.5 mm, which provides an arc length of about 10.2 mm. In the context herein, "about" is within 5 mm. In a preferred embodiment, the length of the interior edge of the handle opening is about 289 mm. The length of the interior edge of the handle opening can be between about 260 mm and about 320 mm, with any combination of H1, H2, H3, H4, R1 and R2. It will be appreciated that these dimensions are optimized so that a 95th percentile male can grip any of the three handle portions with at least three and preferably four fingers extending through the handle opening to utilize the device. It will be appreciated that any or all of surfaces R1 and R2 can be considered a part of any of the three adjacent handle portions. As shown in FIGS. 1 and 1A, with the finger surface 151a being straight, the first handle portion interior surface, second handle portion interior surface, third handle portion interior surface and finger surface cooperate to define a quadrilateral with radii or rounded edges between each of the straight surfaces.

[00121] Device 212 also includes multiple speed settings (preferably 1500 and 2400 RPM, but can be any speed or frequency taught herein). Furthermore, those of ordinary skill in the art will appreciate that although the RPM is listed as a specific number that, due to manufacturing tolerances, the RPM may oscillate during use. For example, at the 2400 RPM setting the RPM may actually oscillate between 2260 and 2640.

[00122] FIGS. 6-10 show some of the interior and exterior components that are included in the treatment devices 212 (208 and 210) shown in FIGS. 1-5 and 11-16. As shown in FIG. 6, the percussive massage device 212 includes a housing 101 that is comprised of first and second housing halves 103. Outer covers 213 and top cover 215 are received on and connected to the first and second housing halves 103, via tabs 105 or other mechanism or attachment method (e.g., threaded fasteners, clips, adhesive, sonic welding, etc.). The percussive massage device 212 also includes a tambour door 217, battery 114, inner suspension rings 219 and rotation housing 44 (with first and second rotation housing halves 44a and 44b) that houses the gearbox 404.

[00123] As shown in FIG. 7, the device includes a pinion coupling assembly 216 that is disposed between the motor and the pinion shaft or shaft gear 117 (located on the shaft or pinion shaft 116). The pinion coupling assembly 216 is used to couple the motor to the gearbox so that the torque is fully transmitted, such that there is no radial movement and the vibrations and noise are minimized. The pinion coupling assembly 216 preferably includes three separate components, a lower connector 218, a cross coupling 220 and an upper connector 222. In a preferred embodiment, the lower connector 218 includes a main body portion 218a that defines a central opening 218b that receives the motor shaft 248 and first and second lower connector arms 218c extending outwardly from the main body portion 218a. The upper connector 222 includes a main body portion 222a that defines a central opening 222b that receives the pinion shaft 117 and first and second upper

connector arms 222c extending outwardly from the main body portion 222a. Preferably, the cross coupling 220 includes radially extending ribs 220a that define channels 220b therebetween. The first and second lower connector arms 218c and the first and second upper connector arms 222c are sized and shaped to be received in the channels 220b to operatively engage the radially extending ribs. In use, the motor shaft 248 rotates the pinion coupling assembly, which rotates the pinion shaft 117. These components work together to reduce noise and vibration. In a preferred embodiment, the lower and upper connectors are made of plastic and the cross coupling is made of an elastomer. In a preferred embodiment, the cross coupling 220 is made of rubber that includes a hardness where vibrations generated by the motor are isolated while keeping the strength and transmitting the torque efficiently (without significant energy dissipation). However, the materials are not a limitation on the present invention.

[00124] In a preferred embodiment, the pinion shaft 116 is received in and extends through bearings 224 and 225. Preferably, bearing 224 includes ball bearings (and provides radial support) and bearing 225 includes needle bearings (and provides radial support, but can withstand higher temperatures). The pinion coupling assembly 216 is housed in motor mount 250, which is connected to the motor 106 and through which the motor shaft 248 extends. The motor mount 250 is connected to the gear box mount 252, as shown in FIG. 9.

[00125] As shown in FIGS. 7-9, the gearbox 404, in one embodiment, includes the gear member 304 and the reciprocator or push rod 230/310. Preferably, the gear member 304 includes a shaft 246 extending therefrom to which the reciprocator 310 is connected. The gearbox 404 may provide mounting points for the gear member 304 and the reciprocator 310. The gearbox 404 may restrict the motion of the gear member 304 and the reciprocator to certain directions or rotational axes. The gearbox 404 may be mounted to the housing

101. In some embodiments, the gearbox 404 is separated from the housing 101 by the one or more compliant dampening blocks 402.

[00126] As shown in FIGS. 6 and 8, in a preferred embodiment, to prevent the gearbox from transmitting vibrations to the housing a rubber cover can be provided. Further inner suspension rings 219 isolate vibration of the gearbox from handle and the treatment structures. Preferably, the rings 219 are made of an elastomer and act as a cushion to dampen vibrations between the rotation housing and the housing 101. In a preferred embodiment, the inner suspension rings 219 surround the outer radial surface of the main body portion 62 (see seat surface 523 in FIG. 8).

[00127] In one embodiment, rotation of the actuated output or shaft 108 may be selectively locked and unlocked by a user. For example, the user may unlock rotation of the shaft 108, rotate the actuated output 108 to a desired position relative to the housing 101, lock rotation of the actuated output 108, and operate the reciprocating treatment device 100. FIG. 8 shows the components that allow rotation of the rotation housing 44 together with the push rod assembly 108 and related components. Button 515 includes radially extending teeth 515a and is biased outwardly by spring 519, which surrounds and is seated on spacer 518 (which is preferably made of foam). Spring 519 is seated against dampening members 520 and 517, which are preferably made of rubber to dampen any vibrations of the spring 519. The assembly also includes a gear box cover 525 and dampening ring 521. Button 515 is outwardly biased by spring 519 to a position where teeth 515a are engaged with teeth 516a, which are defined hoop 516, which is connected to housing 101. Preferably hoop 516 includes inner and outer plastic rings 516b and 516c that sandwich a rubber ring 516d therebetween to help dampen vibrations and reduce noise. The button 515 is movable between a first position where teeth 515a are engaged with teeth 516a and a second position where teeth 515 are not engaged with teeth 516a. When the button 515 is in the

first position, the rotation assembly 47 cannot rotate. When the button is pushed to the second position, the teeth 515a disengage from teeth 516a, thereby allowing the entire rotation assembly 47 to rotate. The rotation housing 44 includes a main body portion 62 disposed in the housing and an arm portion 64 extending through the rotation space 60 and outside the housing. The arm portion 64 rotates within the rotation space 60 defined in the housing 101. As shown in FIG. 2, in a preferred embodiment, the device 212 includes a tambour door 217 that unfolds within the rotation space 60 as the rotation assembly is moved from the position shown in FIG. 1 to the position shown in FIG. 2. The tambour door 217 covers slot 214. As shown in FIG. 2, an arm cover 524 covers the arm portion 64 of the rotation housing 44.

[00128] As shown in FIG. 9, the gearbox housing 404 includes a clearance slot 214 defined therein for the push rod assembly 108. The slot 214 is provided so the push rod assembly 108 can move freely and allow the rotation housing 44 to articulate. The clearance slot 214 has first and second ends 214a and 214b. As shown in FIG. 9, the push rod assembly 108 extends through the clearance slot 214. it will be appreciated that when the rotation housing 44 is rotated from a first position to a second position the push rod assembly 108 moves within the clearance slot 214 from the first end to the second end thereof.

[00129] As shown in FIGS. 8-10, in a preferred embodiment, the pushrod assembly or output shaft 108 includes two halves or rods with an adapter member 226 therebetween to also help reduce noise and vibration. The adapter member 226 isolates the vibrations generated in the gearbox and prevents them from being transmitted down the shaft to the treatment structure. The adapter member 226 can include anti-rotation tabs to protect the push rod from user applied torque during use. The first rod portion 230 of the output shaft 108 (push rod or reciprocator 310) includes an opening 232 on an end thereof that receives a pivot pin 234. The connection between the first rod portion 230 and the adapter member 226

includes a bushing 227 with the pin 234 and elastomeric material to dampen vibrations. The end of first rod portion 230 that includes opening 232 is received in a pocket 229 in adapter member 226. The pin 234 extends through openings in the side walls of adapter member 226, through bushing 227 and through opening 232, to secure first rod portion 230 to adapter member 226. Adapter member 226 includes a protrusion 231 extending therefrom that is received in an opening 233 in an end of the second rod portion 236, to connect the adapter member 226 to the second rod portion 236. In another embodiment, the end of the second rod portion 236 can be received in an opening in the adapter member 226. In use, the size of the top opening of pocket 229 allows the first rod portion to move side to side as the opening 232 pivots on pin 234 and first rod portion 231 reciprocates. This translates to linear reciprocation of second rod portion 236. Because the bushing 227 comprises at least some elastomeric material, vibrations are dampened (and noise reduced) as the push rod assembly 108 reciprocates.

[00130] Ring 526 is seated on and surrounds the bottom portion of the arm portion 64 (see seat 64a in FIG. 8) to help hold the first and second housing halves 44a and 44b together. Washer or guide member 527 is received in the rotation housing 44 and provides stability and a path for the reciprocating push rod assembly or output shaft 108.

[00131] As shown in FIG. 9, in this embodiment, the first rod portion 230 or push rod assembly 108 extends through clearance slot 214. It will be appreciated that the term pushrod assembly includes any of the embodiments described herein and can include a shaft with an adapter member allowing pivoting between two halves or can include a single shaft that does not include any pivoting.

[00132] As shown in FIGS. 9-10, in a preferred embodiment, the male connector 110 includes an alignment tab 497 above each ball that mates with a slot in the female opening.

These tabs 497 help with proper alignment with the treatment structure. See U.S. Patent App. No. 2019/0017528, the entirety of which is incorporated herein by reference.

[00133] FIGS. 11-16 show embodiments of percussive massage devices similar to percussive massage device 212 above, but without a rotation assembly. Device 208, shown in FIGS. 11-14 is referred to commercially as the G3. Device 210, shown in FIGS. 15-16 is referred to commercially as the LIV. As is shown in FIG. 13, in a preferred embodiment, switch 104 includes switch electronics 575 associated therewith. The switch electronics 575 may include a printed circuit board (PCB) and other components to allow the switch 104 to activate the motor 106 and to change the speed of the motor, turn the device on and off, among other tasks. As shown in FIG. 13, in a preferred embodiment, the motor 106 is housed in the third handle portion 147, the battery 114 is housed in the second handle portion 145 and the switch electronics 575 are housed in the first handle portion 143. This configuration also applies to devices 210 and 212. FIG. 14 shows cushion members 577 that surround the gearbox 404 and help dampen and reduce noise and vibration generated by the components in the gearbox. Cushion members 577 are similar to inner suspension rings 219 in device 212. However, cushion members 577 are thicker and do not need to rotate due to the exclusion of the rotation housing in devices 208 and 210. Cushion members 577 include cutouts or channels 579 therein to allow clearance of components such as the push rod assembly and pinion shaft.

[00134] FIGS. 17-35 show embodiments in accordance with a percussion massage device with a force meter. FIG. 17 is a block diagram showing interconnected components of a percussive therapy device with a force meter 700. In an embodiment, the percussive therapy device with force meter 700 includes a microcontroller unit 701, a battery pack management unit 702, an NTC sensor 703, a power charging management unit 704, a wireless charging management unit 705, a wireless charging receiving system 706, a

voltage management unit 707 (5V 3.3V Voltage Management in drawings), battery charging inputs 708 (20V 2.25A Charging Inputs in drawings), a display 709 (Force/Battery/Speed Display in drawings), a wireless control unit 710 (Bluetooth Control in drawings), an OLED screen 711, an OLED screen control system 712, a motor 713, a motor drive system 714, a PWM speed setup unit 715, an over-current protection unit 716, and a power switch unit 717 (Power On/Off OLED Screen SW in drawings). In the embodiment shown in accordance with FIG. 17, each block in the diagram is shown as a separate component. In alternative embodiments, however, certain components may be combined without departing from the scope of the present disclosure.

[00135] The microcontroller unit 701, in an embodiment, is a microcontroller unit including a processor, a memory, and input/output peripherals. In other embodiments, however the microcontroller unit 701 is an ST Microelectronics STM32F030K6 series of microcontroller units, STM32F030C8T6 series of microcontrollers, STM32F030CCT6 series of microcontrollers, or an equivalent microcontroller.

[00136] One of ordinary skill would understand that the memory of the microcontroller unit 701 is configured to store machine-readable code for processing by the processor of the microcontroller unit 701. Various other configurations may exist depending on whether the designer of the percussive massage device with force meter 700 desires to implement the machine-readable code in software, firmware, or both. In an embodiment, the machine-readable code is stored on the memory and configured to be executed by a processor of the microcontroller 701. In an embodiment, the machine-readable code is stored on computer-readable media.

[00137] The battery pack management unit 702, in an embodiment, is implemented in firmware or software and configured to be used in connection with the microcontroller unit 701. In this embodiment, the firmware or software is stored in memory (not shown) and

configured to be obtainable by the microcontroller unit 701. The battery pack management unit 702 may also be a combination of firmware, software, and hardware, in another embodiment. The battery pack management unit 702 is coupled with the NTC sensor 703. The NTC sensor 703 is a negative temperature coefficient thermistor used by the battery pack management unit 702 to sense temperature of the battery pack. For example, the NTC sensor 703 is a thermistor with B value of 3950 +/- 1%, and a resistance of 10 kΩ. In another example, the thermistor has a resistance of 100 kΩ. One of ordinary skill in the art would recognize that a thermistor is a resistor whose resistance is dependent upon temperature. In other embodiments, however, the NTC sensor 703 may be another type of temperature sensing device or component used in connection with the battery pack management unit 702.

[00138] The power charging management unit 704, in an embodiment, is implemented in firmware or software and configured to be used in connection with the microcontroller unit 701. Similarly to the battery pack management unit 702, the power charging management unit 704 firmware or software is stored in memory (not shown) and configured to be obtainable by the microcontroller unit 701. The power charging management unit 704 may also be a combination of firmware, software, and hardware, in another embodiment. In various embodiments, the power charging management unit 704 is configured to charge a battery pack via a direct connection or through an external charger, such as when configured to be operable with rechargeable batteries.

[00139] The wireless charging management unit 705, in an embodiment, is coupled to the battery pack management unit 702 and the battery charging inputs 708. In other embodiments, the battery or battery pack is charged using other conventional methodologies, such as, for example, charging the battery or battery pack using a wire or cord coupled to the battery charging inputs 708.

[00140] The wireless charging receiving system 706, in an embodiment, is coupled to the power charging management unit 704 and the display 709. The wireless charging receiving system 706 includes one or more of firmware, software, and hardware. In an embodiment, the wireless charging receiving system 706 is configured to receive information pertaining to battery capacity, charging metrics, and other information pertaining to wireless charging, and to pass along the information to the power charging management unit 704. The wireless charging receiving system 706 preferably includes a wireless charging pad used to charge the percussive massage device with force meter 700. One of ordinary skill in the art would understand that a variety of wireless charging devices may be utilized to wirelessly charge the percussive massage device with force meter 700. As one example, the Qi wireless charging standard and related devices may be utilized to wirelessly charge the percussive massage device with force meter 700.

[00141] The voltage management unit 707, in an embodiment, is a DC voltage regulator that steps down 5 volt to 3.3 volt power for use by the microcontroller unit 701. The voltage management unit 707 may also perform additional functions for management of 3.3 volt power for use by the microcontroller unit 701. In an embodiment, the voltage management unit 707 is implemented using a series of electronic components such as, for example, implementing a resistive divider using electronic components. In another embodiment, the voltage management unit 707 is a stand-alone voltage regulator module and/or device designed to step down voltage from 5 volts to 3.3 volts. One of ordinary skill in the art would understand the various methodologies and devices available to step down 5 volts to 3.3 volts.

[00142] The battery charging inputs 708, in an embodiment, are interfaces by which a wire or cord may be inserted for charging the percussive massage device with force meter 700. For example, a standardized barrel connector is the battery charging inputs 708. In another

example, the battery charging inputs 708 is a USB connector. Other more specialized charging methodologies may require a particular battery charging input not described above.

[00143] The display 709, in an embodiment, displays a series of LEDs depicting an amount of force applied by the percussive massage device with force meter 700. In an alternative embodiment, the display 709 displays a series of LEDs depicting the current battery or battery pack charge of the percussive massage device with force meter 700. In yet another embodiment, the display 709 displays a series of LEDs depicting the current speed of the percussive massage device with force meter 700. One of ordinary skill in the art would recognize that while LEDs have been specified in the above-referenced embodiments, other embodiments not using LEDs are within the scope of this disclosure, such as, for example, liquid crystal displays, OLEDs, CRT displays, or plasma displays. One of ordinary skill in the art would also understand that it may be advantageous in an embodiment utilizing a battery or battery pack to use low-power options to ensure battery power longevity. In an embodiment, the display 709 is a 128x64 pixel OLED display.

[00144] The wireless control unit 710 is a wireless connectivity device that may be implemented in a wireless microcontroller unit. In an embodiment, the wireless control unit 710 is a Bluetooth transceiver module configured to couple, via Bluetooth, to a remote device. In an embodiment, the Bluetooth module is a Bluetooth Low-Energy (BLE) module configured to be run in broadcast mode. The wireless control unit 710 is coupled to the microcontroller unit 701. In an embodiment, the remote device is a smartphone having an embedded Bluetooth module. In an alternative embodiment, the remote device is a personal computer having Bluetooth connectivity. In other embodiments, other wireless connectivity standards besides the Bluetooth wireless standard may be utilized. It will be appreciated that the Bluetooth connectivity or other wireless connectivity may be described

herein as being implemented in a wireless connection device. The wireless connection device can be a separate module, can be included in the MCU or other component of the device, or can be a separate chip. In summary, the percussive therapy device including a wireless connection device means that the percussive massage device can connect to another electronic device wirelessly (e.g., a phone, tablet, computer, computer, voice controlled speaker, regular speaker, etc.). One of ordinary skill in the art would recognize that low-power wireless control modules may be advantageous when the percussive massage device with force meter 700 is utilizing a battery or battery pack.

[00145] The OLED screen 711 and the OLED screen control system 712, in an embodiment, are configured to display substantially the same information as the display 709 referenced above. The OLED screen 711 is coupled to the OLED screen control system 511. The OLED screen control system 712 is coupled to the microcontroller unit 701, the OLED screen 711, and the power switch unit 717. In an embodiment, the display 709 and the OLED screen 711 may be redundant and it may only be necessary to utilize one or the other.

[00146] The motor 713, in an embodiment, is a brushless direct current (BLDC) motor. The motor 713 and the motor drive system 714, in an embodiment, are configured to vary the speed (i.e., rotational motion) that may be converted to reciprocal motion. In other embodiments, the motor 713 is a brushed DC motor, a brushed AC motor, or a brushless AC motor. One of ordinary skill in the art would understand that choosing a brushless or brushed motor, or direct current or alternating current, may vary depending on the application and intended size, battery power, and use.

[00147] The PWM speed setup unit 715, in an embodiment, is used to control pulse width modulation utilized to drive the motor 713. The PWM speed setup unit 715 is coupled to the microcontroller unit 701 and the over-current protection unit 716. One of ordinary skill

in the art would understand that pulse width modulation is one way to vary the average power applied to the motor 713, resulting in varying speed as desired. In alternative embodiments, one of ordinary skill in the art would understand that there are a variety of methods to vary the speed of a brushless DC motor. For example, voltage to the motor 713 may be controlled in other non-PWM methods.

[00148] The over-current protection unit 716, in an embodiment, may be a feature of an integrated system-in-package to prevent damage caused by high currents to the motor. In other embodiments, the over-current protection unit 716 is implemented using a series of electronic components configured to protect the motor from excessively high current.

[00149] The power switch unit 717, in an embodiment, is configured to turn on and turn off the percussive massage device with force meter 700. The power switch unit 717 is coupled to the OLED screen control system 712 and the microcontroller unit 701. In an embodiment, the power switch unit 717 is the switch 405.

[00150] FIG. 18 shows a circuit diagram of the microcontroller unit 701 with pin outputs. In this embodiment, the STM32F030K6 series of microcontroller units is utilized. The circuit diagram depicts +3.3 volt power being provided to the VDD inputs of the microcontroller unit 701. Input PA3 is labeled "Motor_VOL", the voltage of the motor 713. Input PA2 is "bt_v", the battery or battery pack voltage. The microcontroller unit is configured to receive analog voltage on inputs PA2 and PA3 and to convert it to digital voltage using the microcontroller's analog-to-digital converter. In this embodiment, the analog-to-digital converter is a 12-bit ADC. One of ordinary skill in the art would understand that other microcontrollers may utilize voltage sensing and analog-to-digital converters to perform similar functions. In yet other embodiments, an analog-to-digital converter module separate from a microcontroller may be utilized.

[00151] FIG. 19 shows a circuit diagram used for battery voltage detection. In this embodiment, +BT, the positive battery terminal 518, is coupled to a circuit consisting of a P-channel MOSFET 519, an N-Channel MOSFET 520, 0.1 μF capacitor 521, 100 kΩ resistors 522, 523, 68 kΩ resistor 524, 1 kΩ resistors 525, 526, and 10 kΩ resistors 527, 528. The circuit is configured to provide an input analog voltage of the battery or battery pack, or bt_v, to the microcontroller unit 701 of FIG. 18. In other embodiments, voltage of the battery or battery pack may be achieved using a voltage reader coupled to the terminals of the battery or battery pack.

[00152] FIG. 20 shows a circuit diagram for detection and measurement of voltage of the motor 713 of the percussive massage device. In this embodiment, voltage sensing resistor 529 is coupled in parallel with the microcontroller unit 701, and coupled to the motor 713. In an embodiment, the voltage sensing resistor has a value of 0.0025 Ω. The circuit depicted in FIG. 20 is configured to provide the Motor_VOL input into the microcontroller unit 701 of FIG. 17. In an embodiment, the input analog voltage is amplified. In another embodiment, the voltage of the motor 713 is measured or sensed using a separate series of electronic components or a standalone device and input into a microprocessor for use with the method of displaying a force on the percussive massage device.

[00153] FIG. 21 is a flow diagram showing a method 800 of detecting force applied by the percussive massage device in accordance with a preferred embodiment. At Step 802, a voltage magnitude V is obtained. In an embodiment, voltage magnitude V is an analog voltage obtained by using the circuit disclosed in FIG. 17. In that circuit, a block curve signal from the motor 713 (i.e., a Hall effect sensor) is simulated in the circuit as current using the resistor R, which is placed in parallel with the microcontroller unit 701. In other embodiments, voltage that corresponds to the current operating speed of the motor 713 may be generated in a variety of other ways. The voltage magnitude V may be input to a

microcontroller unit 701 that converts analog voltage to digital voltage using an analog-to-digital converter, such as that implemented in the STM32F030K6 microcontroller unit. The STM32F030K6 microcontroller unit coverts analog voltage magnitude to a digital code corresponding to the 12-bit ADC (i.e., 0 to 4096). The digital code represents a voltage magnitude corresponding to the original voltage magnitude V obtained.

[00154] At Step 804, a lookup table is generated that correlates voltage V to force magnitude F. In an embodiment, the lookup table is generated using a method 900 of generating a lookup table correlating voltage to force. For example, the force magnitude F may be expressed in pounds of force. In an alternative embodiment, the force magnitude F may be expressed in Newtons of force.

[00155] At Step 806, the force magnitude F corresponding to voltage magnitude V is displayed on the percussive massage device with force meter 700. In an embodiment, a series of LED lights may be utilized to depict varying amounts of force as the force is being applied by the percussive massage device with force meter 700. Thus, as the amount of force magnitude F increases, more LEDs on the series of LED lights will be lit. Preferably, the series of LED lights consists of 12 LED lights.

[00156] FIG. 22 is a flow diagram showing a method 900 of generating a lookup table correlating voltage to force. At Step 902, a maximum magnitude of force, F_{MAX}, is determined. The magnitude of F_{MAX} may be determined by assessing the maximum desired force to apply using the percussive massage device with force meter 700. As an example, F_{MAX} is 60 pounds of force.

[00157] At Step 904, a maximum magnitude of voltage, V_{MAX}, is determined. The magnitude of V_{MAX} may be determined by assessing the maximum theoretical voltage change possible by the percussive massage device with force meter 700. As an example, V_{MAX} is 1.8 volts.

[00158] At Step 906, F_{MAX} is divided into equal increments. Using the above example from Step 902, 60 pounds of force is divided into 60 one-pound increments.

[00159] At Step 908, V_{MAX} is divided into the same amount of increments as determined in Step 906 above. Thus, using the above example from Step 904, 1.8 volts is divided into 60 0.3-volt increments.

[00160] At Step 910, a lookup table (LUT) is generated that correlates the increments of pounds of force with the increments of voltage. This necessarily creates a linear relationship between force and voltage. FIG. 23 is a graph plotting the LUT for use by the method of detecting force of FIG. 21 that was generated using the specific example identified in FIG. 22. The graph depicts calculated force that was calculated using the method 900.

[00161] A problem may arise in that the theoretical maximum voltage assumption at Step 904 in the method 900 is inaccurate. It may also be the case that as the percussive massage device with force meter 700 is used, the maximum available voltage degrades over time. In other words, the battery or battery pack voltage may decrease.

[00162] Accordingly, a method 1000 of calibrating the LUT generated by method 900 may be advantageous. FIG. 24 is a flow diagram showing a method 1000 of calibrating a LUT. At Step 1002, battery pack voltage BV is obtained. In an embodiment, battery pack voltage magnitude BV is an analog voltage obtained by using the circuit disclosed in FIG. 19. In that circuit, the battery pack voltage magnitude BV may be input to a microcontroller unit 701 that converts analog voltage to digital voltage using an analog-to-digital converter, such as that implemented in the STM32F030K6 microcontroller unit. The STM32F030K6 microcontroller unit coverts analog voltage magnitude to a digital code corresponding to the 12-bit ADC (i.e., 0 to 4096). The digital code represents a voltage magnitude corresponding to the original battery pack voltage magnitude BV obtained.

[00163] At Step 1004, V_{MAX} is set to the actual battery voltage magnitude BV output. As an example, may decrease from 1.8 volts to 1.74 volts, a 0.6 volt decrease. At Step 1006, the LUT linear correlation is adjusted to reflect the lower V_{MAX}. FIG. 25 is a graph plotting the LUT calculated by the method 900 against the LUT calibrated by using the method 1000. The LUT resulting from method 1000 depicts a calibrated force rather than a calculated force.

[00164] FIG. 26 is a flow diagram showing a method 1100 of calibrating a LUT. The method 1100 may be performed after the method 900, or entirely separately from the method 900. At Step 1102, battery pack voltage BV is measured. In an embodiment, the measurement is done without applying any force from the percussive massage device with force meter 700. In an embodiment, the battery pack voltage BV is measured using an external voltage meter. In another embodiment, the battery pack and/or microcontroller unit 701 have embedded solutions for directly measuring battery pack voltage BV.

[00165] At Step 1104, the display on the percussive massage device with force meter 700 that displays the force magnitude F is read to determine the force magnitude F corresponding to the measured battery pack voltage BV.

[00166] At Step 1106, a force meter is used to measure actual force being applied. In an embodiment, the force meter is a push/pull force meter. The direct measurement of force allows calibration of the LUT by comparing the displayed force magnitude F with the measured actual force. At Step 1108, the LUT is updated with a corrected force corresponding with the measured battery pack voltage BV. After Step 1108, Steps 1102-1106 are repeated for each successive voltage increment. In the embodiment depicted in accordance with the method 900, Steps 1102-1106 are repeated for every 3-volt increment. FIG. 27 is a graph plotting the LUT calculated by the method 1100 after all 3-volt increments had been updated.

[00167] FIG. 28 is a flow diagram showing a method 1200 of detecting force applied by a percussive massage device in accordance with a preferred embodiment. At Step 1202, current magnitude C of a battery pack is obtained. In an embodiment, current magnitude C is input into the microcontroller unit 701. At Step 1204, voltage magnitude BV of a battery pack is obtained. In an embodiment, voltage magnitude BV is input into the microcontroller unit 701. At Step 1206, power is calculated using the product of C and BV. In an embodiment, the microcontroller unit 701 is configured to calculate power by multiplying C and BV. At Step 1208, a lookup table is generated that correlates power magnitude P to force magnitude F. In an embodiment, the lookup table is generated using a method 1300 of generating a lookup table correlating power to force. For example, the power magnitude P may be expressed in watts. In an altemative embodiment, force magnitude F may be expressed in pounds of force or Newtons of force.

[00168] At Step 1210, the force magnitude F corresponding to power magnitude P is displayed on the percussive massage device with force meter 700. In an embodiment, a series of LED lights may be utilized to depict varying amounts of force as the force is being applied by the percussive massage device with force meter 700. Thus, as the amount of force magnitude F increases, more LEDs on the series of LED lights will be lit. Preferably, the series of LED lights consists of 12 LED lights.

[00169] FIG. 29 is a flow diagram showing a method 1300 of generating a lookup table correlating power to force. At Step 1302, a maximum magnitude of power, F_{MAX}, is determined. A theoretical maximum magnitude of power, however, is not a reasonable assumption if the total effective power may be calculated. Equation 1 may be utilized to determine Total Maximum Effective Power (EP_{MAX}).

$$Equation\ 1: Total\ EP_{MAX} = P_{MAX} \times Total\ EP$$

[00170] Equation 2 may be utilized to calculate Total EP, which is then input into Equation 1 above.

$$Equation\ 2: Total\ EP = EP_{BATTERY} \times EP_{PCBA} \times EP_{MOTOR}$$

where Total EP, $EP_{BATTERY}$, EP_{PCBA}, and EP_{MOTOR} are all expressed in percentages, and where PCBA is a printed circuit board assembly.

[00171] In an embodiment, EP (Battery) is 85%, EP (PCBA) is 95%, and EP (Motor) is 75%. Thus, using Equation 2, Total EP is 85% * 95% * 75% = 60.5625%.

[00172] In this embodiment, P_{MAX} is calculated by multiplying the maximum voltage V_{MAX} and the maximum amperage C_{MAX} of the battery pack such as in Equation 3. P_{MAX} is then input into Equation 1.

$$P_{MAX} = V_{MAX} \times C_{MAX}$$

[00173] In this embodiment, V_{MAX} is 16.8 volts and C_{MAX} is 20 amperes. Thus, P_{MAX} is 336 watts.

[00174] Turning back now to Equation 1, if P_{MAX} is 336 watts and Total EP is 60.5625%, then Total EP_{MAX} is 203 watts.

[00175] At Step 1304, a minimum amount of power P_{MIN}, is determined. It will be recognized by one of ordinary skill in the art that the power without any force being applied (i.e., no load) will be non-zero. Thus, P_{MIN} of 12 watts is assumed. One of ordinary skill will also understand that the value of is equivalent to the rated power without load, which may be derived from V_{MAX} and C_{MIN}.

[00176] At Step 1306, a maximum magnitude of force, F_{MAX}, is determined. The magnitude of F_{MAX} may be determined by assessing the maximum desired force to apply using the percussive massage device with force meter 700. As an example, F_{MAX} is 60 pounds of force.

[00177] At Step 1308, Total EP_{MAX} is divided into equal increments. In an embodiment, Total EP_{MAX} is divided in 3 watt increments per one pound of force, starting at P_{MIN} (12 watts). It will be recognized by one of ordinary skill in the art that if F_{MAX} is 60 pounds of force, the total desired force output of the percussive massage device with force meter 700, then 60 pounds of force correlates to 189 watts, within the calculated Total EP_{MAX}.

[00178] At Step 1310, a LUT is generated that correlates the increments of pounds of force with the increments of power in watts. This necessarily creates a linear relationship between force and voltage. FIG. 30 is a graph plotting the LUT for use by the method of detecting force of FIG. 28 that was generated using the specific example identified in FIG. 25. The graph depicts calculated force that was calculated using the method 1200.

[00179] Similarly to the method 900, a problem may arise in that the measured voltage of the battery pack at Step 1204 in the method 1200 is inaccurate. It may also be the case that as the percussive massage device with force meter 700 is used, the maximum available voltage degrades over time. In other words, the battery or battery pack voltage may decrease.

[00180] FIG. 31 is a flow diagram showing a method 1400 of calibrating a LUT. The method 1400 may be performed after the method 900 or the method 1200, or entirely separately from the method 900 or the method 1200. At Step 1402, current magnitude C of a battery pack is obtained. In an embodiment, current magnitude C is input into the microcontroller unit 701.

[00181] At Step 1404, battery pack voltage BV is measured. In an embodiment, the measurement is done without applying any force from the percussive massage device with force meter 700. In an embodiment, the battery pack voltage BV is measured using an external voltage meter. In another embodiment, the battery pack and/or microcontroller unit 701 have embedded solutions for directly measuring battery pack voltage BV. At Step

1406, power is calculated using the product of C and BV. In an embodiment, the microcontroller unit 701 is configured to calculate power by multiplying C and BV.

[00182] At Step 1408, the display on the percussive massage device with force meter 700 that displays the force magnitude F is read to determine the force magnitude F corresponding to the calculated power. At Step 1410, a force meter is used to measure actual force being applied. In an embodiment, the force meter is a push/pull force meter. The direct measurement of force allows calibration of the LUT by comparing the displayed force magnitude F with the measured actual force. At Step 1412, the LUT is updated with a corrected force corresponding with the measured power. After Step 1412, Steps 1402-1410 are repeated for each power or force increment. In the embodiment depicted in accordance with the method 900, Steps 1402-1410 are repeated for every 3-watt increment. FIG. 32 is a graph plotting the LUT calculated by the method 1400 after all 3-watt increments had been updated.

[00183] FIGS. 33-35 show an exemplary percussive massage device 400 that embodies the features disclosed herein, and, in particular, in FIGS. 17-48 (or FIGS. 1-16). Generally, the percussive massage device 400 includes a housing 402, an electrical source or battery pack 114, a motor 406 positioned in the housing 101, and a switch 405 for activating the motor 406. The electronics (see printed circuit board 408 in FIG. 34) includes the controller that is configured to obtain a voltage of the motor, generate a lookup table correlating voltage to force applied by the percussive massage device, and display a force magnitude corresponding to the obtained voltage using the lookup table. **[END OF 5063]**

[00184] FIGS. 36-43A show further views of percussive massage device 400. FIGS. 36 and 37 are similar to FIGS. 1 and 1A and show that percussive massage device 400 includes a similar triangle shape with first, second and third handle portions 143, 145 and 147 that cooperate to define the handle portion 149. Refer to the description of at least FIGS. 1-5

for an explanation of the other reference numerals and features shown in FIGS. 36-40. All features and components described above with respect to any percussive therapy or massage devices may be included in percussive massage device 400.

[00185] As shown in FIGS. 41-43, in a preferred embodiment, the brushless motor 406 is located in the head portion 12. The percussive massage device 400 can include a rotatable arm that is part of rotation housing 44. The motor 406 is located in the rotation housing 44, which is housed with the head portion 12 of the housing 101. In another embodiment, the rotation capability can be omitted.

[00186] In a preferred embodiment, the device includes a push rod or shaft 14 that is connected directly to a shaft 16 that is rotated by the motor 406 and the motor shaft 21 extending therefrom. The shaft 16 can be part of a counterweight assembly 17 that includes a counterweight 19. In a preferred embodiment, the push rod 14 is L-shaped or includes an arc shape, as shown in FIGS. 42A-42B. Preferably, the point where the push rod 14 is connected to the shaft 16 is offset from the reciprocating path that the distal end 18 of the push rod 14 (and the massage attachment 628) travel. This capability is provided by the arc or L-shape. It should be appreciated that the push rod 14 is designed such that it can transmit the force at least partially diagonally or in an arc along its shape instead of vertically so the motor can be located at or near the middle of the device, otherwise a large protrusion would be necessary to keep the shaft in the center with the motor offset therefrom (and positioned in the protrusion). The arc also allows the push rod 14 to have a close clearance with the motor, as shown in FIGS. 42A and 42B and allows the outer housing to be smaller than similar prior art devices, therefore making the device 400 lower profile. FIG. 42A shows the push rod 14 at the bottom dead center of its travel and FIG. 42B shows the push rod 14 at the top dead center of its travel. Preferably one or more bearings 20 are included at the proximal end of the push rod 14 where it connects to the

motor to counteract the diagonal forces and preventing the push rod 14 from moving and touching the motor 406. The bearing 20 is received on shaft 16 and a threaded fastener 26 is received in a co-axial opening 16a in shaft 16. The proximal end of the push rod 14 is received on bearing 20. These components are all shown in FIG. 43.

[00187] As shown in FIG. 33, in a preferred embodiment, the device 400 includes a touch screen 409 (also referred to herein as touch screen 1582 in association with method steps) as well as button(s) for operating the device (e.g., stopping, starting, activating, changing speeds, amplitudes, etc.). The touch screen 409 can also include other functions. The device 400 can also include a thumbwheel or rolling button positioned near the touch screen/on off button to allow the user to scroll or navigate through the different functions. touch screen 409 for operating the device. In the embodiment, shown in FIG. 33, the device 400 includes touch screen 409, a center button 404 for turning the device on and off and a ring/rocker button 447 that provides the ability to scroll left and right (e.g., to the preset treatments discussed herein) and up and down (e.g., to control the speed or frequency). The screen can also be a non-touch screen or just used for display.

[00188] In another preferred embodiment, any of the devices taught herein can include the ability to vary the amplitude or stroke, thus providing a longer or shorter stroke depending on the application or needs of the user. For example, the stroke can change or be changed between about 8-16 mm. In another embodiment, the stroke can be varied up to 25 or more mm. The amplitude/stroke variability can also be part of the routines, presets or protocols discussed herein. For example, the device can include a mechanical switch that allows the eccentricity of the connector to be modified (e.g., between 4mm and 8mm). The mechanism can include a push button and a slider. The pin structure has a spring that lets it fall back into the locked position.

[00189] Similar to percussive massage devices 208, 210 and 212 above, in a preferred embodiment, device 400 includes a number of dampening components that are made of an elastomer or the like and damp vibrations to keep the device relatively quiet. For example, as shown in FIG. 43, device 400 includes dampening rings 426 (similar to inner suspension rings 219) that surround the rotation housing 44 (with first and second rotation housing halves 44a and 44b) and help dampen the sound of vibration between the rotation housing and outer housing 101.

[00190] As shown in FIGS. 43 and 43A, the device 400 preferably also includes a motor mount 24 that secures the motor 406 in place and is secured to the housing 101/402. Motor 406 includes a receiving member 28 with three protrusions 30 (and number between one and ten can be included) that is received in a protrusion opening 32 defined in the motor mount 24 (in first wall 38). Flanges 34 extending from the motor mount 24 help keep the protrusions 30 in place. The motor 406 is preferably secured via threaded fasteners or the like to the motor mount 24. Motor shaft 21 extends into the motor mount interior 36, which is defined between first and second walls 38 and a side 40 that extends part of the way around the circumference. The counterweight assembly 17, proximal end of the push rod 14 and related components for converting the rotation of the motor shaft 21 to reciprocating motion are position in the motor mount interior 36. The push rod 14 extends downwardly out of the motor mount interior and through a push rod opening 42 in the side 40. In a preferred embodiment, the motor mount 24 is connected directly to the housing 402/101 via fasteners 46 that are secured to mounting members 48 in the housing (see FIG. 43A). It will be appreciated that the term push rod assembly used herein includes any of the components discussed herein or combinations thereof, e.g., push rod 14, output shaft 108, reciprocator 310, second rod portion 236, that extend from the rotating motor shaft 21, shaft 246 or the like that provide reciprocating motion and include the attachment on the

distal end thereof. The push rod assembly also includes the male connector 110 (and any related components) or any other connector at the end of the reciprocating components that allows connection of an attachment to be used for massage or therapy.

[00191] Preferably the device can be wirelessly charged. FIG. 34 shows the wireless charging receiver 22, which is positioned in the third handle portion 147. In another embodiment, the wireless charging receiver 22 can be located either of the first and second handle portions 143 and 145 or in the head portion 12.

[00192] In a preferred embodiment, the device 400 is associated with and can be operated by an app or software that runs on a mobile device such as a phone, watch or tablet (or any computer). The app can connect to the device 400 via bluetooth or other wireless connection protocol. The app can have any or all of the following functions. Furthermore, any of the functions discussed herein can be added to the touch screen/scroll wheel or button(s) capability directly on the device. If the user walks or is located too far away from the device, the device will not work or activate. The device can be turned on an off using the app as well as the touch screen or button on the device. The app can control the variable speeds (e.g., anywhere between 1750-3000 RPM). A timer can be implemented so the device stops after a predetermined period of time.

[00193] In a preferred embodiment the device, via the app or the touch screen and other functional buttons, etc. includes different treatment protocols or routines associated therewith. During the routine, the device can vary different aspects or outputs of the device or make changes based on time, speed (frequency), amplitude (stroke), arm position, force, temperature, grip (i.e., which handle portion to grip), attachment (e.g., cone, ball, dampener, etc.) and body part. The device (via the app, touch screen, haptic feedback or audibly via a speaker) can also prompt the user to make some of these changes at certain points throughout the routine, e.g., arm position, grip, attachment changes and body part

changes. One of ordinary skill in the art will understand that, depending upon the particular design of the device, one or more of these outputs are applicable, while in other devices, all options described are applicable.

[00194] When the start of the protocol is selected, the device runs through a preprogrammed routine. For example, the device may operate at a first RPM for a first period of time and then operate at a second RPM for a second period of time and/or at a first amplitude for a first period of time and then operate at a second amplitude for a second period of time. The routines can also include prompts (e.g., haptic feedback) for letting the user to know to move to a new body part. These routines or treatments can be related to recovery, blood flow increase, performance, etc. and can each include a preprogrammed routine or protocol. These routines can also help facilitate certain activities, such as sleep, interval training, stairs, post-run, post-workout, recovery, wellness, post-core exercise, high intensity (plyometric) workouts, among others. The routines can also assist in providing relief and recovery from ailments such as plantar fasciitis, "tech neck," muscle cramps, jet lag, sciatica, carpal tunnel, knots, and shin splints, among others. The routines can also prompt or instruct the user to switch attachments (e.g., attachment 628 shown in FIG. 40) or positions of the arm or rotation housing. The prompts can include sounds, haptic feedback (e.g., vibration of the device or mobile device), textual instructions or visual representation such as a graphic or picture on the app or touch screen, etc. For example, the app may instruct the user to start with the ball attachment with the arm in position two. Then the user hits start and the device runs at a first frequency for a predetermined amount of time. The app or device then prompts the user to begin the next step in the routine and instructs the user to change to the cone attachment and to place the arm in position 1 (e.g., see the arm position in FIG. 38). The arm can include any number of positions, e.g., 1-10 positions or 1-3 positions or 1-2 positions. FIGS. 38-40 show the arm in three different

positions. The user hits start again and the device runs at a second frequency for a predetermined amount of time. The protocol can be divided into steps where, at each step, varied outputs are predetermined or specified.

[00195] In a preferred embodiment, the device 400 includes a housing 402 (or 101), an electrical source 114, a motor 406 positioned in the housing 402, a switch 405 (which can be any of the touch screen 409, rocker button 447, button 404 or any other switch or button) for activating the motor 406, and a routine controller 630. The device 400 is configured to mate with an attachment 628. The attachment can be, for example, the attachment 628 shown in FIG. 38. The attachment is affixed to the male connector 110 so that the shaft or push rod assembly 108 moves the attachment reciprocally in accordance with a specified amplitude. For example, the amplitude is depicted in FIGS. 42A and 42B, where FIG. 42A shows the attachment at a maximum extended position and FIG. 42B shows the attachment at a minimum extended position. The distance between maximum and minimum extended positions can, in an embodiment, define the amplitude.

[00196] The attachment 628 can be a variety of attachments configured to provide therapeutic relief to specified portions of the body. For example, the attachment 628 can be a standard ball (see U.S. Patent App. No. 29/677,157, the entirety of which is incorporated herein by reference) attachment targeted for overall use on both large and small muscle groups. The attachment 628 can be a cone attachment (see U.S. Patent No. D849,261, the entirety of which is incorporated herein by reference) for pinpoint muscle treatment, trigger points, and small muscle areas like the hands and feet. The attachment 628 can also be a dampener attachment (see U.S. Patent App. No. 29/676,670, the entirety of which is incorporated herein by reference) used for tender or bony areas, but also for overall uses. The attachment 628 can be a wedge attachment (see U.S. Patent No. D845,500, the entirety of which is incorporated herein by reference) for use on shoulder blades ant IT bands, used

for "scraping" and "flushing" motions that help to flush lactic acid out of muscles. The attachment 628 can be a large ball (see U.S. Patent App. No. 29/677,016, the entirety of which is incorporated herein by reference) for large muscle groups like glutes and quads. The attachment 628 can be a thumb attachment (see U.S. Patent No. D850,639, the entirety of which is incorporated herein by reference) used on trigger points and the lower back. The attachment 628 can be a Supersoft™ attachment (see U.S. Patent App. No. 29/726,305, the entirety of which is incorporated herein by reference), designed to provide therapeutic relief to sensitive areas, including bones. One of ordinary skill in the art would recognize that the attachments described herein are non-limiting and other configurations of attachments, including varying materials and shapes, may be utilized in accordance with this embodiment. Spherical, forked, flat or other shaped attachments are all within the scope of the invention.

[00197] The routine controller 630 is configured to perform a routine in connection with one or more specified protocols. The routine controller 630 can be, for example, the microcontroller unit 701 depicted in FIG. 17. The routine controller 630 can also be a standalone microcontroller separate from the microcontroller 701. The routine controller can step through different steps of a specified protocol designed to target specified muscle groups and to provide certain therapeutic effects, as described herein.

[00198] FIG. 44 is a table showing an example of a protocol in accordance with a preferred embodiment. Protocol 1 is divided into four steps, each depicting a specified time, speed, amplitude, attachment, force, temperature, and grip. At Step 1, the device 400 is activated for 30 seconds at a speed of 1550 RPM. A routine controller 630 may be utilized to turn on the percussive massage device and implement a speed of the attachment 628 of 1550 RPM. One of ordinary skill in the art would understand that the speed of the attachment 628 is directly proportional to the speed of the motor 406. The amplitude of the percussive

massage device is set to be 2 in accordance with Protocol 1. This may translate to a specified distance that an attachment 628 moves while in use, as described above. Step 1 also specifies a dampener attachment affixed to the device 400, a force of "1" be applied by the device 400, and a temperature of 21 °C be applied to the attachment.

[00199] One of ordinary skill in the art would understand that the force to be applied by the device 400 may depend upon the pressure exerted by the user in pressing the attachment onto a person's body part. As described more fully herein, the force to be applied by the device 400 may be the target force. In an embodiment where the user provides pressure to exert a particular force upon a person's body part, the routine controller 630 may adjust the output of the device 400 to ensure that the force actually applied by the attachment is the target force. The routine controller 630 may also be configured to provide feedback to the user to increase or decrease pressure on a person's body part to meet the target force. Each of these embodiments is applicable to each of the steps of a given protocol, including in Steps 2-4 below, as well as Steps 1-4 of the protocol shown in FIG. 45.

[00200] Step 1 also specifies that the device 400 is to be operated using grip 1. Grip 1, for example, may be the grip shown on the first handle portion 143 depicted in FIG. 39, otherwise referred to as a "regular" or "standard" grip. Grip 2, for example, may be the grip shown on the third handle portion 147 depicted in FIG. 40, otherwise referred to as a "reverse" grip. An "inverse" grip can also be used on third handle portion 147 (not shown). Grip 3, for example, may be the grip shown on the second handle portion 145 depicted in FIG. 41, otherwise referred to as a "base" grip.

[00201] At Step 2, Protocol 1 specifies that the device 400 be activated for 15 seconds at 2100 RPM, with an amplitude of "3", a force of "3", and a temperature of 26 °C. Step 2 specifies that the small ball attachment 628 be used, and that the device 400 is to be

operated using grip 1. Step 2 therefore requires that the dampener attachment in Step 1 be replaced by the small ball attachment, but specifies that the same grip is to be used.

[00202] At Step 3, Protocol 1 specifies that the device 400 be activated for 30 seconds, at 2200 RPM, with an amplitude of "1", a force of "3", and a temperature of 29 °C. Step 3 specifies that the dampener attachment 628 be used, and that the device 400 is to be operated using grip 1. Step 3 therefore requires that the small ball attachment in Step 2 be replaced by the dampener attachment, but specifies that the same grip is to be used.

[00203] At Step 4, Protocol 1 specifies that the device 400 be activated for 45 seconds, at 2400 RPM, with an amplitude of "4", a force of "2", and a temperature of 32 °C. Step 3 specifies that the large ball attachment be used, and that the device 400 is to be operated using grip 1. Step 3 therefore requires that the dampener attachment in Step 2 be replaced by the large ball attachment, but specifies that the same grip is to be used. It will be appreciated that Protocol 1 is provided as an example to the reader of many of the different outputs that can be changed during a myriad of treatment protocols that can be provided or developed. It will be further appreciated that any one or more of the outputs can be a part of a protocol or routine and any of the outputs discussed herein can be omitted. For example, a protocol may only include time and speed or only time speed and force, or only time, speed and grip or any other combination of the outputs described herein.

[00204] FIG. 45 is a table showing an example of a "Shin Splints" protocol in accordance with a preferred embodiment. Like Protocol 1, the Shin Splints protocol is divided into four steps, each depicting a specified time, speed, amplitude, attachment, force, temperature, and grip, but also specifying a particular arm position and body part to which to apply the attachment. At Step 1, the device 400 is activated for 1 minute at a speed of 1500 RPM, with an amplitude of "1", a force of "2", and a temperature of 21 °C. Step 1

specifies that the dampener attachment be used, and that the device 400 is to be operated using grip 2 ("Reverse"), to the right shin.

[00205] Step 1 also specifies the arm position 632, 634, 636 to be used is arm position 1. One of ordinary skill in the art would understand that the numbers of arm position (e.g., 1, 2, 3, 4, etc.) are predetermined arm positions intended to be used during a particular protocol. The part of the body to which the attachment 628 is to be applied is one of the factors in determining an optimal arm position. The arm position, however, may be determined by the user and is not required to otherwise implement a protocol. As shown in FIG. 39, a "standard" grip may be utilized with arm position 632 to apply to specific parts of the body. As shown in FIG. 40, a "reverse" grip may be utilized with arm position 634 to apply to specific parts of the body. As shown in FIG. 41, a "base" grip may be utilized with arm position 636 to apply to specific parts of the body. One of ordinary skill in the art would recognize that the arm position 632, 634, 636 in combination with the particular grip 143, 145, 147 may vary depending on the application. One of ordinary skill in the art will understand that setting the arm position of a device 400 depends upon the specific device. For example, certain devices may allow a user to adjust arm position while others do not. For those that do not, this step does not apply. In other embodiments, this step may be performed during execution of the steps of the particular protocol.

[00206] At Step 2, the Shin Splints protocol specifies that the device 400 be activated for 1 minute at 1500 RPM, with an amplitude of "1", a force of "2", and a temperature of 21 °C. Step 2 specifies that the dampener attachment be used, and that the device 400 is to be operated using grip 2 ("Reverse"), at an arm position 1, to the left shin. Step 2 therefore uses the same attachment, grip, and arm position as Step 1, but is applied to the other shin.

[00207] At Step 3, the Shin Splints protocol specifies that the device 400 be activated for 1 minute at 2000 RPM, with an amplitude of "3", a force of "3", and a temperature of 24 °C.

Step 2 specifies that the dampener attachment be used, and that the device 400 is to be operated using grip 3 ("Base"), at an arm position 1, to the right calf. Step 3 therefore requires that the user change grips from "reverse" to "base" grips, but specifies that the same attachment and arm position be used.

[00208] At Step 4, the Shin Splints protocol specifies that the device 400 be activated for 1 minute at 2000 RPM, with an amplitude of "3", a force of "3", and a temperature of 24 °C. Step 2 specifies that the dampener attachment be used, and that the device 400 is to be operated using grip 3 ("Base"), at an arm position 1, to the left calf. Step 2 therefore uses the same attachment, grip, and arm position as Step 1, but is applied to the other calf.

[00209] FIG. 46 is a series of flow diagrams (FIGS. 46A, 46B, 46C) showing a method 1500 of executing a routine for a percussive massage device.

[00210] FIG. 46A is a flow diagram showing an exemplary protocol initiation. At Step 1502, Protocol 1 is initiated. Protocol 1, for example, is the Protocol 1 depicted in FIG. 44 or the "Shin Splints" Protocol depicted in FIG. 45. One of ordinary skill in the art would understand that Protocol 1 depicted in FIG. 44 does not include all of the outputs that are specified in the Shin Splints Protocol depicted in FIG. 45, and thus, not all steps of the method 1500 apply to the Protocol 1 depicted in FIG. 44.

[00211] At Step 1504, a user is prompted to set the arm position to the specified arm position 632, 634, 636. The user may be the person using the device 400 on their own body or on the body of another person. The arm position 632, 634, 636 specified in the Shin Splints Protocol is arm position 1, for example.

[00212] At Step 1506, the user is prompted to use a specified grip or handle portion 143, 145, 147 on the device 400. The grip specified in the Shin Splints Protocol is the third handle portion 147, for example. As described herein, the grip may vary depending on the particular protocol or step.

[00213] At Step 1508, the user is prompted to affix a specified attachment to the device 400. As described herein, the attachment may vary depending on the particular protocol or step.

[00214] At Step 1510, the method determines whether the arm position 632, 634, 636 and the grip position 143, 145, 147 are configured appropriately and whether the attachment 628 is affixed. Step 1510 may involve a prompt to the user by haptic feedback, application interface, or touch screen (among other types of prompts) in which the user is asked to proceed when the appropriate arm position, grip, and attachment are ready. In other embodiments, the device 400 may sense that the arm position and grip are appropriate and that an attachment is affixed before proceeding automatically. In an embodiment, Step 1510 is repeated until the arm position, grip, and attachment are ready.

[00215] FIG. 46B is a flow diagram showing an exemplary Step 1 of the protocol, continuing the method 1500 where FIG. 46A left off.

[00216] At Step 1512, Step 1 of the protocol is initiated. Step 1, for example, is Step 1 depicted in FIGS. 44 and 45, for example.

[00217] At Step 1514, the method 1500 applies a specified time period (T_1) in which the device 400 is activated, a speed of the attachment, an amplitude of the attachment, a force of the attachment, and a temperature of the attachment. In an embodiment, one or more of these outputs of the device 400 are applied. These outputs may be applied by the routine controller 630. One of ordinary skill in the art would understand that a user's implementation of the device 400 on a body part is not required to apply certain of these outputs. For example, the time period, speed, amplitude, and temperature are not necessarily dependent upon a user applying pressure to a body part. On the other hand, the force applied by the attachment 628 may require a user to exert pressure on a body part for a target force (or a target force range) to be reached. Further, the temperature may vary depending on whether the attachment 628 is applied to a body part, or not, and to which

body part it is applied. Thus, the temperature may need to be adjusted during application of the attachment 628 to reach a desired temperature predetermined by the protocol. In another embodiment, the temperature may be adjusted by a user.

[00218] After time period T_1, the user may be prompted to change the attachment 628, arm position 632, 634, 636, and/or grip position 143, 145, 147. These outputs may need to be implemented prior to the start of Step 2 of a protocol. In the Shin Splints Protocol depicted in FIG. 45, the attachment 628, arm position 632, 634, 636 and grip position 143, 145, 147 remain the same. At Step 1516, after time period T_1, the user is prompted to set the arm position to the specified arm position 632, 634, 636. The user may be the person using the device 400 on their own body or on the body of another person.

[00219] At Step 1518, the user is prompted to use a specified grip 143, 145, 147 on the device 400. As described herein, the grip may vary depending on the particular protocol or step.

[00220] At Step 1520, the user is prompted to affix a specified attachment 628 to the device 400. As described herein, the attachment 628 may vary depending on the particular protocol or step.

[00221] At Step 1522, the method determines whether the arm position 632, 634, 636 and the grip position 143, 145, 147 are configured appropriately and whether the attachment 628 is affixed. This step and all other like steps are optional. Step 1510 may involve a prompt to the user by haptic feedback, application interface, or touch screen (among other types of prompts) in which the user is prompted to move to the next step in the routine and/or requested to proceed when the appropriate arm position, grip, and attachment are ready. In other embodiments, the device 400 may sense that the arm position and grip are appropriate and that an attachment is affixed before proceeding automatically. In an embodiment, Step 1522 is repeated until the arm position, grip, and attachment are ready.

[00222] FIG. 46C is a flow diagram showing an exemplary Step 2 of the protocol, continuing the method 1500 where FIG. 46B left off.

[00223] At Step 1524, Step 2 of the protocol is initiated. Step 2, for example, is Step 2 depicted in FIGS. 44 and 45, for example.

[00224] At Step 1526, the method 1500 applies a specified time period (T_2) in which the device 400 is activated, a speed of the attachment, an amplitude of the attachment, a force of the attachment, and a temperature of the attachment. In an embodiment, one or more of these outputs of the device 400 are applied. These outputs may be applied by the routine controller 630. One of ordinary skill in the art would understand that a user's implementation of the device 400 on a body part is not required to apply certain of these outputs. For example, the time period, speed, amplitude, and temperature are not necessarily dependent upon a user applying pressure to a body part. On the other hand, the force applied by the attachment 628 may require a user to exert pressure on a body part for a target force to be reached. Further, the temperature may vary depending on whether the attachment 628 is applied to a body part, or not, and to which body part it is applied. Thus, the temperature may need to be adjusted during application of the attachment 628 to reach a desired temperature predetermined by the protocol. In another embodiment, the temperature may be adjusted by a user.

[00225] After time period T_2, the user may be prompted to change the attachment 628, arm position 632, 634, 636, and/or grip position 143, 145, 147. These outputs may need to be implemented prior to the start of Step 3 of a protocol. In the Shin Splints Protocol depicted in FIG. 45, the attachment 628 and arm position 632, 634, 636 remain the same, but the grip 143, 145, 147 is adjusted to the base grip. At Step 1528, after time period T_2, the user is prompted to set the arm position to the specified arm position 632, 634, 636. The user

may be the person using the device 400 on their own body or on the body of another person.

[00226] At Steps 1528-1534, therefore, steps substantially the same as Steps 1516-1522 are performed. After Step 1534, Steps 3-4 are initiated in substantially the same manner as Steps 1-2. For example, Steps 3 and 4 may be Steps 3 and 4 of the Protocol 1 depicted in FIG. 44 or the Shin Splints Protocol depicted in FIG. 45. Furthermore, Step 1534 can be omitted in a device where none of the grip, arm position or attachment can be sensed by the device. In this embodiment, the given protocol simply moves from step 1 to step 2 prompting the user to make a change (but regardless of whether the user has actually made a change).

[00227] As an alternative to FIG. 46C, FIG. 46D is a flow diagram depicting an alternative Step 2 of a protocol. In the alternative Step 2, a force meter adjustment is implemented.

[00228] Steps 1536-1538 are performed substantially the same as Steps 1524-1526 in previous Step 2 above.

[00229] At Step 1540, the force being applied by the attachment 628 is monitored. In the embodiment shown in FIG. 46D, the method 1500 utilizes the force meter 700 to monitor the force actually being applied by the user.

[00230] At Step 1542, the force is displayed to the user. In an embodiment, the force is displayed on an application interface 1584 such as a graphical user interface. In other embodiments, individual use or combined use of the application interface 1584, touch screen 1582, the OLED screen 711, or the like, may be used to display the force.

[00231] At Step 1546, the user is prompted to increase or decrease the force being applied to a body part according to the specified protocol during T_2. FIG. 48 is a diagram showing a touch screen 1582 in accordance with an exemplary embodiment of the display of the force. A force display 1590 shows an exemplary embodiment of Step 1546. The force

display 1590 shows a series of force measurements over the course of the "Right Bicep" step of a protocol. A force display prompt 1592 is used to display a message to the user such as "PERFECT PRESSURE: WELL DONE" when the force applied by the attachment 628 matches or corresponds to a target force predetermined by the protocol. In this embodiment, the force display prompt 1592 may recite "INCREASE PRESSURE" or the like if the measured force applied by the attachment 628 is lower than the target force predetermined by the protocol. Consequently, if the measured force applied by the attachment 628 is higher than the target force predetermined by the protocol, then the force display prompt 1592 may recite "DECREASE PRESSURE" or the like. The user may then adjust the pressure the user is exerting on the body part to either increase pressure or decrease pressure according to the force display prompt 1592 so that the measured force is equivalent or substantially equivalent to the target force.

[00232] After time period T_2, the user may be prompted to change the attachment 628, arm position 632, 634, 636, and/or grip position 143, 145, 147. These outputs may need to be implemented prior to the start of Step 3 of a protocol. In the Shin Splints Protocol depicted in FIG. 45, the attachment 628 and arm position 632, 634, 636 remain the same, but the grip 143, 145, 147 is adjusted to the base grip. At Step 1528, after time period T_2, the user is prompted to set the arm position to the specified arm position 632, 634, 636. The user may be the person using the device 400 on their own body or on the body of another person.

[00233] At Steps 1548-1552, therefore, steps substantially the same as Steps 1516-1522 are performed. After Step 1534, Steps 3-4 are initiated in substantially the same manner as Steps 1-2. For example, Steps 3 and 4 may be Steps 3 and 4 of the Protocol 1 depicted in FIG. 44 or the Shin Splints Protocol depicted in FIG. 45.

[00234] FIG. 47 is a diagram in accordance with an exemplary embodiment of an application interface 1584. At the top of the interface 1584, a protocol field 1556 is displayed to the user. In this embodiment, the protocol field 1556 is "TECH NECK." The protocol title 1556 also shows the overall time period of the protocol.

[00235] The next portion of the interface 1584 shows step fields 1558-1568 of the protocol that are displayed to the user. In this embodiment, the step fields identify the title of the step and time period of the step. For example, step field 1558 is titled "RIGHT BICEP" (where the treatment will be provided) and the time period of activation is "0:30 MIN."

[00236] The interface 1584 also includes a current step field 1570 that identifies the current step title 1570, a grip title display 1572, and an attachment title display 1574.

[00237] The interface 1584 also includes a time display 1576 and a time remaining display 1578 to show the user how much time has occurred during that step and the time remaining in that step. Finally, the interface 1584 includes a control field 1580 to play, skip back, and skip forward from step to step.

[00238] As described above, FIG. 46 shows a touch screen 1582 on a mobile device. The touch screen 1582 displays a graphic depicting a starting point 1586 "A" and an end point 1588 "B" (thereby defining a treatment path) showing the user where to apply the attachment 628 to the specified body part. In FIG. 46, the display instructs the user to move the attachment from the lower portion of the right bicep to the upper portion of the right bicep (the treatment path) during the current step. In some embodiments, during a single step, the user may be prompted or shown on the graphical user interface more than one treatment path (or a first treatment path and a second treatment path) on the same body part/muscle or on different body parts/muscles. For example, during the right bicep step, the user may be prompted to first move the device along the path shown in FIG. 47, but,

during the same 30 second step may also be prompted or shown a path that is parallel to the path shown in FIG. 47.

[00239] Although the operations of the method(s) herein are shown and described in a particular order, the order of the operations of each method may be altered so that certain operations may be performed in an inverse order or so that certain operations may be performed, at least in part, concurrently with other operations. In another embodiment, instructions or sub-operations of distinct operations may be implemented in an intermittent and/or alternating manner.

[00240] Unless the context clearly requires otherwise, throughout the description and the claims, the words "comprise," "comprising," and the like are to be construed in an inclusive sense, as opposed to an exclusive or exhaustive sense; that is to say, in the sense of "including, but not limited to." As used herein, the terms "connected," "coupled," or any variant thereof, means any connection or coupling, either direct or indirect, between two or more elements; the coupling of connection between the elements can be physical, logical, or a combination thereof. Additionally, the words "herein," "above," "below," and words of similar import, when used in this application, shall refer to this application as a whole and not to any particular portions of this application. Where the context permits, words in the above Detailed Description of the Preferred Embodiments using the singular or plural number may also include the plural or singular number respectively. The word "or" in reference to a list of two or more items, covers all of the following interpretations of the word: any of the items in the list, all of the items in the list, and any combination of the items in the list.

[00241] Embodiments are envisioned where any of the aspects, features, component or steps herein may be omitted and/or are option. Furthermore, where appropriate any of

these optional aspects, features, component or steps discussed herein in relation to one aspect of the invention may be applied to another aspect of the invention.

[00242] The above-detailed description of embodiments of the disclosure is not intended to be exhaustive or to limit the teachings to the precise form disclosed above. While specific embodiments of and examples for the disclosure are described above for illustrative purposes, various equivalent modifications are possible within the scope of the disclosure, as those skilled in the relevant art will recognize. For example, while processes or blocks are presented in a given order, alternative embodiments may perform routines having steps, or employ systems having blocks, in a different order, and some processes or blocks may be deleted, moved, added, subdivided, combined, and/or modified to provide alternative or subcombinations. Each of these processes or blocks may be implemented in a variety of different ways. Also, while processes or blocks are at times shown as being performed in series, these processes or blocks may instead be performed in parallel, or may be performed, at different times. Further any specific numbers noted herein are only examples: alternative implementations may employ differing values or ranges.

[00243] The above-detailed description of embodiments of the disclosure is not intended to be exhaustive or to limit the teachings to the precise form disclosed above. While specific embodiments of and examples for the disclosure are described above for illustrative purposes, various equivalent modifications are possible within the scope of the disclosure, as those skilled in the relevant art will recognize. Further, any specific numbers noted herein are only examples: alternative implementations may employ differing values, measurements or ranges. It will be appreciated that any dimensions given herein are only exemplary and that none of the dimensions or descriptions are limiting on the present invention.

[00244] The teachings of the disclosure provided herein can be applied to other systems, not necessarily the system described above. The elements and acts of the various embodiments described above can be combined to provide further embodiments.

[00245] Any patents and applications and other references noted above, including any that may be listed in accompanying filing papers, are incorporated herein by reference in their entirety. Aspects of the disclosure can be modified, if necessary, to employ the systems, functions, and concepts of the various references described above to provide yet further embodiments of the disclosure.

[00246] These and other changes can be made to the disclosure in light of the above Detailed Description of the Preferred Embodiments. While the above description describes certain embodiments of the disclosure, and describes the best mode contemplated, no matter how detailed the above appears in text, the teachings can be practiced in many ways. Details of the system may vary considerably in its implementation details, while still being encompassed by the subject matter disclosed herein. As noted above, particular terminology used when describing certain features or aspects of the disclosure should not be taken to imply that the terminology is being redefined herein to be restricted to any specific characteristics, features or aspects of the disclosure with which that terminology is associated. In general, the terms used in the following claims should not be construed to limit the disclosures to the specific embodiments disclosed in the specification unless the above Detailed Description of the Preferred Embodiments section explicitly defines such terms. Accordingly, the actual scope of the disclosure encompasses not only the disclosed embodiments, but also all equivalent ways of practicing or implementing the disclosure under the claims.

[00247] While certain aspects of the disclosure are presented below in certain claim forms, the inventors contemplate the various aspects of the disclosure in any number of claim

forms. For example, while only one aspect of the disclosure is recited as a means-plus-function claim under 35 U.S.C. §112, ¶6, other aspects may likewise be embodied as a means-plus-function claim, or in other forms, such as being embodied in a computer-readable medium. (Any claims intended to be treated under 35 U.S.C. §112, ¶6 will begin with the words "means for"). Accordingly, the applicant reserves the right to add additional claims after filing the application to pursue such additional claim forms for other aspects of the disclosure.

[00248] Accordingly, although exemplary embodiments of the invention have been shown and described, it is to be understood that all the terms used herein are descriptive rather than limiting, and that many changes, modifications, and substitutions may be made by one having ordinary skill in the art without departing from the spirit and scope of the invention.

CLAIMS

What is claimed is:

1. A percussive therapy device comprising:

a housing,

an electrical source,

a motor positioned in the housing,

a switch for activating the motor, and

a push rod assembly operatively connected to the motor and configured to reciprocate in response to activation of the motor.

2. The percussive therapy device of claim wherein the housing includes first, second and third handle portions and a head portion that cooperate to define a handle opening, wherein the first handle portion defines a first axis, the second handle portion defines a second axis and the third handle portion defines a third axis, wherein the first, second and third axes cooperate to form a triangle, wherein the motor is positioned in the head portion of the housing, and wherein at least a portion of the push rod assembly extends outside of the head portion.

3. The percussive therapy device of claim 2 wherein the first handle portion is generally straight, wherein the second handle portion is generally straight, and wherein the third handle portion is generally straight.

4. The percussive therapy device of claim 1 further comprising a wireless connection device.

5. The percussive therapy device of claim 1 wherein the electrical source is a rechargeable battery, and wherein the percussive massage device further comprising a wireless charging receiver that is in electrical communication with the battery.

6. The percussive therapy device of claim 1 further comprising a touchscreen.

7. The percussive therapy device of claim 1 wherein the motor is a brushless motor, wherein a motor mount is positioned in the housing, wherein the motor is secured to the motor mount, and wherein the motor mount is secured to the housing.

8. The percussive therapy device of claim 7 wherein the motor mount includes first and second side walls that define a motor mount interior therebetween, wherein the motor is secured to the first side wall and wherein the second side wall is secured to the housing.

9. The percussive therapy device of claim 8 wherein the motor includes a motor shaft that extends through a protrusion opening defined in the first side wall of the motor mount and into the motor mount interior, and wherein at least a portion of the push rod assembly is positioned in the motor mount interior.

10. The percussive therapy device of claim 1 further comprising an attachment connected to a distal end of the push rod assembly, and a routine controller that is configured to initiate a protocol configured to provide user instructions to apply the attachment to a first body part for a first period of time along a first treatment path and to apply the attachment to the first or a second body part for a second period of a time along a second treatment path.

11. The percussive therapy device of claim 10 wherein the user instructions are provided via a touch screen on the percussive therapy device or on an application on a remote electronic device.

12. The percussive therapy device of claim 1 further comprising an attachment connected to a distal end of the push rod assembly, and a routine controller that is configured to initiate a protocol configured to provide user instructions to apply the attachment to a first body part for a first period of time and to apply the attachment to the first or a second body part for a second period of a time, wherein the routine controller is configured to reciprocate the attachment at a first speed during the first period of time and at a second speed during the second period of time.

13. The percussive therapy device of claim 1 further comprising a routine controller that is configured to initiate a protocol to activate the motor for at least a first period of a

time and a subsequent second period of time, wherein during the first period of time the routine controller is configured to provide first user instructions to perform a first task comprising at least one of treating a first body part, moving the attachment along a first treatment path, and connecting a first attachment to a distal end of the push rod assembly, and wherein during the second period of time the routine controller is configured to provide second user instructions to perform a second task comprising at least one of treating a second body part, moving the attachment along a second treatment path, and connecting a second attachment to the distal end of the push rod assembly.

14. The percussive therapy device of claim 13 wherein the first user instructions comprise at least one of treating the first body part, moving the attachment along the first treatment path, connecting the first attachment to the distal end of the push rod assembly and grasping one of a first, second or third handle portion, and wherein the second user instructions comprise at least one of treating the second body part, moving the attachment along the second treatment path, connecting the second attachment to the distal end of the push rod assembly, and grasping one of the first, second or third handle portion.

15. The percussive therapy device of claim 13 wherein the first user instructions comprise at least one of treating the first body part, moving the attachment along the first treatment path, connecting the first attachment to the distal end of the push rod assembly and applying a first target force, and wherein the second user instructions comprise at least one of treating the second body part, moving the attachment along the second treatment path, connecting the second attachment to the distal end of the push rod assembly, and applying the first target force or a second target force.

16. The percussive therapy device of claim 13 wherein the first and second user instructions are provided via a touch screen on the percussive therapy device or on an application on a remote electronic device.

17. The percussive therapy device of claim 2 wherein the electrical source is a battery that is positioned in the second handle portion, and wherein a wireless charging receiver that is in electrical communication with the battery is positioned in the third handle portion.

ABSTRACT

A percussive therapy device that includes a housing, an electrical source, a motor positioned in the housing, a switch for activating the motor, and a push rod assembly operatively connected to the motor and configured to reciprocate in response to activation of the motor. The housing includes first, second and third handle portions and a head portion that cooperate to define a handle opening. The first handle portion defines a first axis, the second handle portion defines a second axis and the third handle portion defines a third axis and the first, second and third axes cooperate to form a triangle. The motor is positioned in the head portion of the housing, and at least a portion of the push rod assembly extends outside of the head portion.

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	PERCUSSIVE THERAPY DEVICE
First Named Inventor/Applicant Name:	Jason Wersland
Filer:	Brennan C. Swain/Sharon Duncan
Attorney Docket Number:	76840-5077

Filed as Small Entity

Filing Fees for Track I Prioritized Examination - Nonprovisional Application under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
UTILITY FILING FEE (ELECTRONIC FILING)	4011	1	75	75
UTILITY SEARCH FEE	2111	1	330	330
UTILITY EXAMINATION FEE	2311	1	380	380
REQUEST FOR PRIORITIZED EXAMINATION	2817	1	2000	2000
Pages:				
Claims:				
Miscellaneous-Filing:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
PUBL. FEE- EARLY, VOLUNTARY, OR NORMAL	1504	1	0	0
PROCESSING FEE, EXCEPT PROV. APPLS.	2830	1	70	70
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**2855**

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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)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	TrackOne Request	76840_5077_Req_Prioritized_Exam.pdf	116701 43d2622c05b2ce80a53eec476c5aa0defc520897	no	2
Warnings:					
Information:					
2	Application Data Sheet	76840_5077_ADS.pdf	1439155 8f42e7b088371dfea3ca730dc6b1d071379c9e62	no	10
Warnings:					
Information:					
3	Drawings-only black and white line drawings	76840_5077_Drawings.pdf	2269982 7c297a84371eda7237becd8553fe8f596b707599	no	50
Warnings:					
Information:					
4		76840_5077_Specification.pdf	447996 fe8fc4f124017895de16347ad91938f0a9daefd2	yes	75

Multipart Description/PDF files in .zip description

Document Description	Start	End
Specification	1	71
Claims	72	74
Abstract	75	75

Warnings:					
Information:					
5	Fee Worksheet (SB06)	fee-info.pdf	40234 a0d4c1bf818e59e2de57b2fa38ce985c5ec47e76	no	2

Warnings:	
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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.