

주파수 동작 모드형태에 따른 통증 완화용 복합치료 시스템의 개발연구 (Composition treatment system relationship special quality research for ache mitigation by frequency action mode form)

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요약

Lately, result that the myopathy occurrence rate such as muscle disease and brain apoplexy by the tribe of momentum by aging society and information-oriented society, imbecility, Parkinson's disease, motor nerve disease is increasing rapidly and investigates the occurrence rate, was expose that increased more than man case 2 double and man and woman of mortality increases by about 50% with Parkinson's disease and motor nerve disease. <중략> Is going to apply to myopathy patient of other disease if supplement system hereafter, and this research tried to study rain standardization special quality and approach producing poetic theme width directly.

Abstract

최근에 고령화 사회와 정보화 사회에 따른 운동량의 부족으로 인한 근육질환과 뇌졸중, 치매, 파킨슨병, 운동신경 질환 등 근질환 발생률이 급증하고 있으며 발생률을 조사한 결과, 남성경우 2 배이상 증가했고, 파킨슨병과 운동신경질환 등 사망률은 남녀가 약 50%씩 늘어난 것으로 나타났다. 환경적 요인이 크게 작용하며 특히, 우려할 것은 급속히 증가하는 노인인구로 인한 노인성 질환 및 근질환의 대책이 무엇보다 요구되는 실정으로 발병하면 치료가 어렵고, 후유증이 심각하므로 무엇보다 예방이 중요하다. 위험인자와 발생위험을 조기에 예방할 수 있도록 간접운동을 확인할 수 있는 시 저주파-초음파 장비를 통해 시중에 나와있는 장비의 기준을 정하고 특성시험과 모델링화 하여 성능의 우수성을 입증하여 정리하였다. 차후 시스템을 보완하면 다른 질병의 근질환 환자에도 적용이 될 것이고, 본 연구에서는 시제품을 직접 제작하여 비정형화 특성을 연구하고 접근해 보고자 노력하였다.

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I . Introduction

Nothing but supersonic waves is not heard in our ear, is same with ordinary sound wave. Special quality or physical propensity is same sound enemy and think that there is more supersonic wave during air than all voices that is heard in ear. Supersonic waves of asexuality that escape human's perception area is used extensively in power enemy, information adaptation field already. Function is developing epochally supersonic waves treatment appliance as well as ultra sonograph by Dept. of Electronic Engineering IT's development. In the 2000s, may take charge second role present because diffusion is magnified entering. But, supersonic waves field is eternal development possibility yet.

Because supersonic waves is applied by medical treatment, military affairs, examination appliance as well as surrounding industrial equipment getting into the spotlight as advanced technology recently owing on request that is development of electronics industry and lively international cross-fertilization, actuality enemy, fiction, detection, position control, washing, welding, cinder catcher, examination, measure, measuring, appliance, practical use anger is widening in very various field until skin, beauty art, bathing, washing up, rinsing the mouth, massage even. Supersonic waves beat frequency 17,000 ~ being elastic wave that occur as being not right membrane shock sound wave and by shock of object that is 20,000Hz something wrong, have effect and supersonic waves treatment treats using supersonic waves in ordinary 0.5 ~ 5 MHz and sound wave uses drug stuffs through skin by supersonic waves energy and use method introduced before formation.

II . Hardware design

Used on-chip PIC16F74 and RD7 controls and controls output department through 74HC154 and

controls time through R15 i resistance department, mode, space, automatic/by hand, beginning/suspension and so on from FND 0 through resistance 22 itches to FND7 in RD0. Figure 2 controls beginning, output, mode set etc. from channel 2 - 25 to 30 as assistance circuit. The following SND-4270 2 level distribution and time field doing this using TR A1015, 5 handle . After poetic theme width that embody in this research inputs commercial power of rated voltage 220V, 60Hz by supply cord in appliance, fuse (and composing voltage electric current amplifier by transistor coming Rinia interchange to be boosted the voltage to maximum medicine 30Vp-p at stimulation output voltage, subordinate because device operates passing do still more was linked and also did to stimulate output code being supplied to abode from output connector .

Zero adjusting device (Zero start device) had and does drive by equilibrator. Also, because fuse device (AC 230V, 2A) is built-in course current city automatically power short-circuit . Operation principle can divide stimulation department which do part that produce final controlling element that do key and indication device that take charge selection of function and control that control and frequency that need in stimulation and frequency that happen in eruption department at minuteness element by each channel frequency and can by part and so on that handle various function etc. to CH 1~2 output channel and main circuit part that increase.

Generally, control and control output department through 74HC154 from FND 0 through resistance to FND 7 because display transaction and display between city and use On-chip PIC16F74 and time through R15 resistance department, mode, space, automatic/by hand, beginning/suspension and so on handled control. 1 as frequency indicator low frequency stimulation frequency and mode mark 2 as output electric current indicator output current of low frequency stimulation indication, 3 as supersonic

waves output indicator century of supersonic waves output as establishment indicator during indication, 4 stimulation time that increase treatment time by branch indication, 5 as supersonic waves output selection indicator supersonic waves output selection (900kHz, 3MHz) indication, 6 as supersonic waves Doja temperature overheating indicator if supersonic waves temperature is overheated.

be 7 marks supersonic waves output mode as supersonic waves action mode indicator, CON supersonic waves output appears consecutively and supersonic waves output of 10 is 10Hz, and 25 supersonic wase output is 25Hz, and 50 silvers supersonic waves output is 25Hz, and 8 is low frequency action mode selection switch this. Is monad that selection, 9 regulates century of low frequency output as low frequency output century regulator, low frequency of 10 is displayed as low frequency output monad and 11 is monad that supersonic waves 3MHz is displayed by supersonic waves output monad 1 (3MHz) low frequency action mode to ST1 ~ ST2, and 12 is monad that supersonic waves (900kHz) supersonic waves 900kHz is displayed. 13 controls supersonic waves output as supersonic waves output regulator, 14 switch, 15 that establish operating time as operating time establishment switch starts action of appliance as appliance action beginning switch and 16 selects supersonic output 900kHz, 3MHz at supersonic waves output monad selector. 17 halts appliance action as appliance suspension switch, and 18 selects supersonic waves action mode as supersonic waves action mode selector, and 19 acts as all switches.

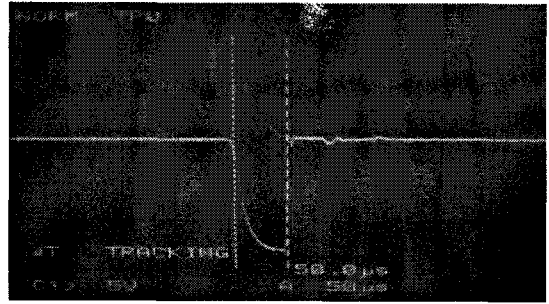


Fig .1 time output waveform

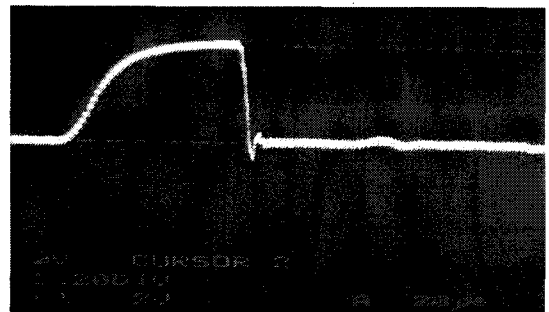


Fig .2 Voltage output waveform

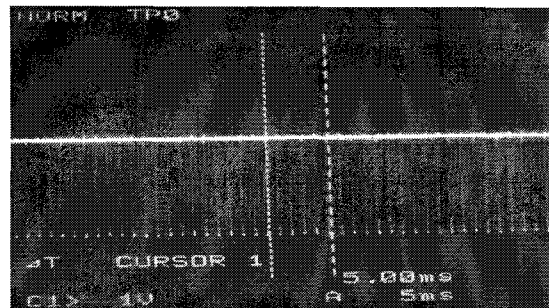


Fig .3 999 Hz Push Waveform

III. Experiment result and fur diagnosis

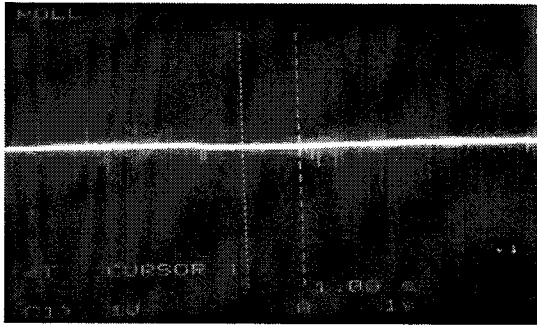


Fig. 4. Variable Frequency Massage

Professional scum of type that embody in this research appeared and composed by greatly 2 to figure 6. First, as low frequency stimulation flag, main frame department including final controlling element and output department, Come on! composed by highest degree thing, Zero start (zero control) device, stimulation electrode, output indication department, timer etc.

The following does main frame department, adjustment department, as supersonic waves stimulation flag, composed by supersonic waves, Zero-start (zero control device), output indication wealth, timer etc. (400Hz, subordinate 500 Ω s), maximum output current within rated voltage that do low frequency stimulation chapter if examine special quality and frequency 220VAC, 60Hz and consumption electric power 300 W, maximum output voltage 45Vp-p \pm 10% : 18mA virtual value (400Hz, subordinate 500 Ω s), output waveform composed by constant voltage way, shot direction, pulse welsh onion, pulse width 50 μ s.

Establishment of establishment capacitated by 1 - 60 minute during treatment time. It did to become waveform that established frequency is continued without change that press. Figure 3 displays output waveform during time, figure 8 voltage output waveform that figure 3 presses 999Hz in waveform

frequency waveform that is continued changelessly appear. Figure 10 is waveform that change slowly by maximum output in rubdown waveform, and output of figure 12 appears by turning (rolling) in partial destruction (phase difference 180 ?) form.

Action mode algorithm can explain as following. That figure 3 ST1 (automatic) presses 30Hz repeatedly in 3Hz, repeat rubdown, turning action until establishment time. That figure 14 presses 1000Hz repeatedly in 5Hz by ST2 (automatic), repeat rubdown, turning action until establishment time. That figure 15 presses 100Hz repeatedly in ST3 (automatic) 3Hz, repeat rubdown, turning action until establishment time. That figure 4 presses 400Hz repeatedly in ST4 (automatic) 175Hz, repeat rubdown, turning action until establishment time.

That figure 4 presses ST4 repeatedly in ST5 (automatic) ST1, do rubdown, turning action until establishment time. For reference, figure 12 marks press, massage, rolling. Special quality of supersonic waves stimulation processing unit can arrange as follows. Could establish until 1 ~ 60 minute the rated voltage and frequency AC 220V, 60Hz, 300mA, supersonic frequency 1 MHz/3MHz, supersonic waves output 2.5 W/below cm², treatment time. Embodiment according to patient's state is available variously by experiment incidental and CON mode, 10 modes, 25 modes, 50 modes etc. that figure 4 displays and sees mode frequency waveform. Established sample that can decide basis standard for supersonic waves through an experiment, low frequency treatment equipment.

V. Conclusion

Professional scum of soysauce type that come design and embody through manufacture composed by greatly 2. First, do low frequency stimulation chapter and the following within the rated voltage

that do low frequency stimulation chapter if examine special quality that experiment composing by do supersonic waves stimulation chapter and frequency 220VAC, 60Hz and consumption electric power 300 W, maximum output voltage $45V_{p-p} \pm 10\%$ (400Hz, subordinate 500 Ω s), maximum output current 18mA virtual value (400Hz, subordinate 500 Ω s), output waveform by constant voltage way, shot direction, pulse welsh onion, pulse width $50\mu s$ compose and establishment of establishment capacitated by 1 - 60 minute during treatment time. It did to become waveform that established frequency is continued without change that press. Frequency A displays continued waveform changelessly and rubdown waveform is waveform that change slowly by maximum output and output appears in partial destruction (phase difference 180) form by curl in that press 999Hz waveform. Action mode algorithm can explain as following.

That ST1 (automatic) presses 30Hz repeatedly in 3Hz, repeat rubdown, turning action until establishment time and press 1000Hz repeatedly in 5Hz by ST2 (automatic), rubdown, turning action until establishment time and repeat press 100Hz repeatedly in ST3.(automatic) 3Hz, rubdown, turning action until establishment time, press 400Hz repeatedly in ST4 (automatic) 175Hz, rubdown, turning action press ST4 repeatedly in ST5 (automatic) ST1 until establishment time, rubdown, turning action establish can . The following special quality of supersonic waves stimulation processing unit by series mode through mode frequency waveform, 10 modes, 25 modes, 50 modes etc. variously embodiment according to patient's state possible . Sample that can decide basis standard for supersonic waves through an experiment, low frequency treatment equipment standard for low frequency equipment, supersonic waves treatment equipment that float in city adjusting establishment naturally establish . If arrange specific special quality

late, is seen to guide more superior product.

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