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(54) An indicating system for an electronic shooting game.

(57) An indicating system for an electronic shooting game comprises a xenon flash tube (20) which emits a bright flash when a hit occurs. In addition, sets of LEDs (15, 16) are operated in sequence to indicate a hit. Further, there is a vibrator having a metal casing and being secured to a metal mounting plate of a front body pack (10) to provide a reliable and effective indication to the player who has been hit. The flash tube (20) is connected to an activation circuit which is mounted within a pair of casings which provide RFI shielding and the casings, circuits and tube form a modular member connectable in the body packs (10).

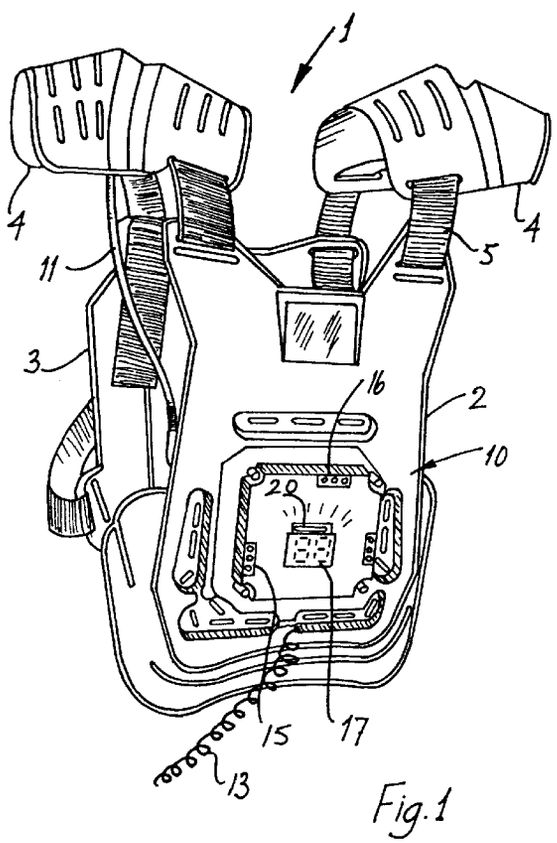

Fig.1

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The invention relates to an indicating system for an electronic shooting game of the type played by teams of players playing in an arena providing a battlefield environment.

It is well known that the appeal of such an electronic shooting game depends on a large extent on the visual effects which are involved and also on the manner in which information is communicated to players. It is often crucial for players of such games to know how team mates are performing, and also indeed opponents so that the correct decisions may be made as the game progresses.

British Patent Specification No. GB 2200732 (Tomy Kogyo) describes an indicating system which comprises a bulb mounted on a headpiece, the bulb flashing at various rates to indicate the number of times a player has been hit. The possible use of a numerical display is also suggested in this patent specification. In British Patent Specification No. GB-A-2216813 (Haselhurst) there is disclosure of use of low-intensity lights which flash quickly when a hit occurs. These lights are mounted on the shooting game gun and may also be mounted on the player's vest. In European Patent Specification No. EP-A-231066 (Futuristic Space Toys) light limiting diodes (LEDs) are described to provide indications of hits. There is also a mention of a small light bulb which can be flashed wherein the duration of flashing is related to the score. These lights are mounted on a gun.

A problem with such indicating systems is that it is often difficult for players to determine very quickly if a hit has been recorded. This is particularly true where the arena has physical barriers which may block light signals.

It is an object of the invention to provide an indicating system which improves communication of hits which have occurred both to the player who has been hit and also to other players, even if they are at some distance in the arena.

Another object of the invention to provide an indicating system for an electronic shooting game which provides an improved visual effect for excitement of the game, particularly for younger players.

A still further object of the invention is to provide an indicating system which is reliable in operation and which is inexpensive to produce.

According to the invention, there is provided an indicating system for an electronic shooting game comprising a shooting game hit condition sensor connected to a light source, characterised in that the light source is a flash tube and is connected to the condition sensor by an activation circuit.

In one embodiment, the activation circuit and the flash tube together form a modular unit connectable to a shooting game apparatus. Ideally, the unit is connectable in a body armour circuit.

In another embodiment, the activation circuit is mounted in a pair of plastics casings, one of which is coated in an RFI shielding coating. There is preferably a metal foil disposed between the two casings for additional RFI shielding.

In one embodiment, the indicating system comprises a substantially rigid metal mounting plate having means for connection to a body armour member.

Ideally, the system further comprises a vibrator connected to the condition sensor and rigidly secured to the mounting plate on an inwardly-directed surface thereof.

Preferably, the vibrator housing comprises an outwardly-directed flange for securing to the mounting plate.

In another embodiment, the indicating system further comprises a vibrator connected to the condition sensor and comprising means for mounting in a shooting game gun.

Preferably, the indicating system comprises a plurality of sets of lights mounted on both front and rear sections of a body armour and being connected to the condition sensor.

According to another aspect, the invention provides a vibrator assembly for a body armour of an electronic shooting game, the vibrator assembly comprising:-

at least one motor having an output shaft with an off-centre weight;

a metal casing housing the motor; and

an integral flange in the metal casing comprising means for connection to a mounting plate of a body pack.

According to a still further aspect, the invention provides a game apparatus comprising:

a set of body armours, each incorporating an indicating system as described above; and

a shooting game gun associated with each item of body armour.

The invention will be more clearly understood from the following description of some embodiments thereof, given by way of example only with reference to the accompanying drawings in which:-

Fig 1 is a front perspective view showing a body armour incorporating an indicating system of the invention;

Fig 2 is a set of sketches showing assembly of a flash tube activation circuit module;

Fig 3(a), 3(b) and 3(c) are a rear view of a front body pack, a perspective view of a vibrator before connection to a mounting plate, and a rear view of the vibrator, respectively;

Fig 4 is a perspective view from the rear showing the rear portion of a body armour;

Fig 5 is a block diagram illustrating construction of one part of the indicating system; and

Fig 6 is a circuit diagram showing a flash tube activation circuit of the indicating system.

Referring to the drawings, there is illustrated a body armour 1 for use by a player during an electronic

shooting game played in an arena. The body armour 1 is of hard plastics material and comprises a front section 2, a rear section 3, and shoulder pads 4. These parts are all interconnected by adjustable straps 5 so that the armour 1 may be worn by people of different sizes.

A front body pack 10 which is of hard plastics material is secured to the front section 2 and is connected by an armoured signal cable 11 to a rear body pack 12 mounted on the rear section 3. The front body pack 10 is connected by a flexible cable 13 to a gun, not shown.

The purpose of the body packs is to record hits on the wearer and to provide information to other players as to the status of the wearer. Both the front and the rear body packs 10 and 12 comprise an electronic control circuit mounted in a box-shaped transparent hard plastics casing, within which there is an advertising sheet advertising the manufacturers of the game apparatus and other data. Apertures are cut in these sheets to allow various output indications to be provided from an indicating system incorporated in the body packs 10 and 12.

The front body pack 10 comprises two sets of side LEDs 15 and a set of top LEDs 16, which LEDs are of different colours to provide team identification data and also for activation when a hit is recorded at an infra-red sensor mounted in the body pack. The control circuit is inserted to activate the LEDs in sequences when a hit is detected by the infra-red condition sensor. There is an electronic numerical display 17 in the front body pack 10 to indicate the player number.

An important part of the indicating system is a flash tube 20 mounted just above the numerical display 17. The flash tube 20 is connected to a flash tube activation circuit 21, the mechanical layout of which is shown in Fig 2. The circuit 21 is mounted in an outer plastics casing 22 which has an RFI shielding inner coating. There is an inner plastics casing 23 and there is also a metal foil sandwiched between the two casings 22 and 23 to provide additional RFI shielding. As shown in Fig 2, the circuit 21 is mounted in the casings 22 and 23 which are then closed over at their integral hinges. The outer rims of the casings 22 and 23 are then sealed using a heat knife and a cut-out is made for exposure of the xenon flash tube 20. Accordingly, the activation circuit 21, the xenon flash tube 20 and the casing together form a flash tube module which incorporates RFI shielding and which may be easily inserted into the front body pack in a modular manner. Because of the RFI shielding provided, reliability of the flash tube is very good and the casings additionally provide mechanical protection of the circuit 21 and of the flash tube 21 for good reliability.

Referring now to Figs 3(a), 3(b) and 3(c), the rear portion of the front body pack 10 is illustrated. The body pack 10 is secured to the front section 2 of the body armour 1 by a steel mounting plate 30 which is riveted to the section 2. Accordingly, the front body pack 10 may be very easily connected to the body armour in a modular fashion so that production of the body armour is relatively simple, and so that repairs may be easily made. This is a very important feature for maintenance of a large number of body armours in a shooting game arena.

The indicating system of the body armour 1 further comprises a vibrator 31 which comprises a pair of motors 32 which have eccentric output shafts 33, the motors being mounted within a rectangular metal casing 34. An important aspect of the vibrator 31 is that it includes a relatively large integral flange 31 which engages the rear surface of the mounting plate 30 and is bolted to it to provide a very secure connection during playing of a game, but which can be easily removed. It has been found that this arrangement of vibrator provides for effective vibration which may be felt by the player to provide a quick indication that he or she has been hit. The casing 34 provides for improved reliability of the vibrator because of protection for the motors 30 and because of the secure connection to the body pack by the flange 35. The vibrator circuit comprises the pair of motors connected in series across a supply, there being a pair of resistors in parallel between the motors. This very much reduces electrical noise feedback to the control circuit.

The rear body pack 12 is shown in Fig 4 and this is connected to the rear section 3 of the body armour 1 using a mounting plate which is similar to the arrangement of the front body pack 10. The rear body pack 12 includes an infra-red sensor and two pairs of side LEDs 40 to provide output team and hit indications.

Referring now to Figs 5 and 6, the activation circuit 21 for the xenon flash tube is shown in more detail. The infra-red condition sensor is indicated by the numeral 50 and this is connected to the activation circuit 21 which is indicated by interrupted lines. The activation circuit 21 comprises a voltage step-up circuit and an oscillator indicated together by the numeral 51, both being connected at the output of a transistor TR2. The base of the transistor TR2 is connected to the infra-red sensor 50. A capacitive circuit 52 comprising a capacitor C3 is supplied with voltage by the oscillator and a voltage trigger 53 detects the level of potential across the capacitor C3. The voltage trigger 53 activates the xenon tube 20 through a transformer 50 which provides the required voltage for operation of the xenon tube 20 in use, when a player is shot.

In use, a pin on the microprocessor of the front body pack control circuit transmits a pulse at the VIB input to the base of the transistor TR2. This is a low pulse and turns TR2 on, thus activating the xenon tube 20 via the circuits 51, 52, 53, and 54. It has been found that this arrangement of activation circuit provides for relatively low power consumption, which is

an extremely important feature in providing for a lengthy play duration before the game apparatus must be "energised".

In use, when a player is hit, the tube 20 almost instantaneously emits a bright flash. This provides an immediate and very easily recognisable indication of a player being hit, even if he or she is fully or partly out of view in the arena. Players who are located at some distance in the arena from the player who is hit will be provided with this information. Communication is very important between team mates, and it is also important to know when hits are recorded against opponents. Thus, operation of the xenon tube 20 provides for both improved excitement, particularly for young players by stronger visual effects and also provides for improved communication between players.

Further, the construction of vibrator is extremely reliable and effective in operation because of its manner of connection to the armour and its location. Thus, it has been found that the combination of the flash tube, the LED sets, and the vibrator provide for a significantly improved degree of communication between players and also improved visual effects at the same time.

Another important aspect of the invention is the modular nature of construction of the body armour, and in particular the manner in which the front and rear body packs may be assembled and connected to the body armour sections, and whereby such items as the flash unit module and the vibrator may be connected.

The invention is not limited to the embodiments hereinbefore described, but may be varied in both construction and detail.

Claims

1. An indicating system for an electronic shooting game comprising a shooting game hit condition sensor connected to a light source, characterised in that the light source is a flash tube (20) and is connected to the condition sensor (50) by an activation circuit (21).

2. An indicating system as claimed in claim 1, wherein the activation circuit and the flash tube together form a modular unit (24) connectable to a shooting game apparatus.

3. An indicating system as claimed in claim 2, wherein the unit is connectable in a body armour circuit (10).

4. An indicating system as claimed in any preceding claim, wherein the activation circuit (21) is mounted in a pair of plastics casings (22,23), one (22) of which is coated in an RFI shielding coating.

5. An indicating system as claimed in claim 3, further comprising a metal foil disposed between the two casings for additional RFI shielding.

6. An indicating system as claimed in any preceding claim, wherein the indicating system comprises a substantially rigid metal mounting plate (30) having means for connection to a body armour member (2).

7. An indicating system as claimed in claim 6, further comprising a vibrator (31) connected to the condition sensor (50) and rigidly secured to the mounting plate (30) on an inwardly-directed surface thereof.

8. An indicating system as claimed in claim 7, wherein the vibrator (31) housing (34) comprises an outwardly-directed flange (35) for securing to the mounting plate (30).

9. An indicating system as claimed in any preceding claim further comprising a vibrator connected to the condition sensor and comprising means for mounting in a shooting game gun.

10. An indicating system as claimed in any preceding claim, further comprising a plurality of sets of lights (15,16) mounted on both front and rear sections of a body armour and being connected to the condition sensor.

11. A vibrator assembly for a body armour of an electronic shooting game, the vibrator assembly comprising:-

    at least one motor (32) having an output shaft with an off-centre weight;

    a metal casing (34) housing the motor; and

    an integral flange (35) in the metal casing comprising means for connection to a mounting plate (30) of a body pack.

12. A game apparatus comprising:-

    a set of body armours (1), each incorporating an indicating system as claimed in any preceding claim; and

    a shooting game gun associated with each item of body armour.

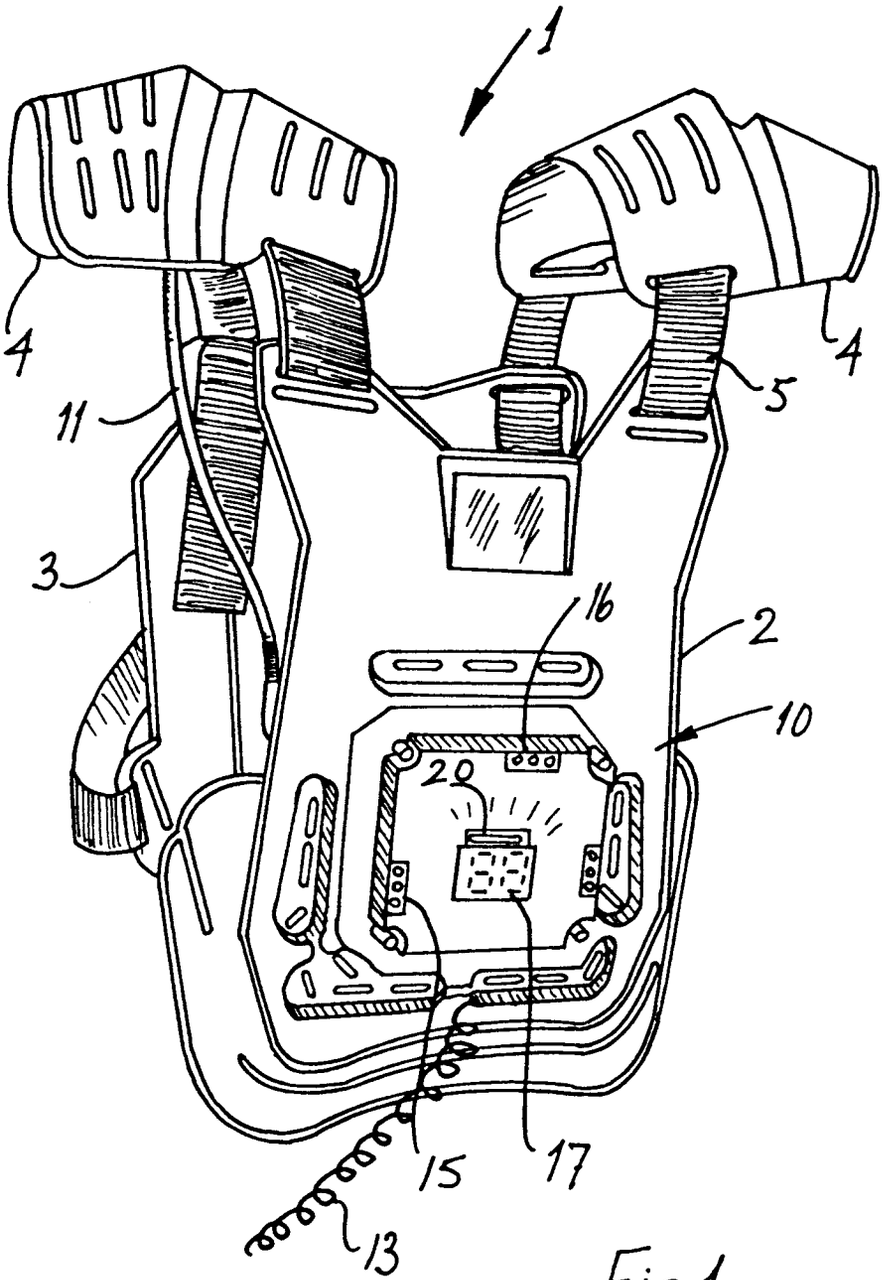
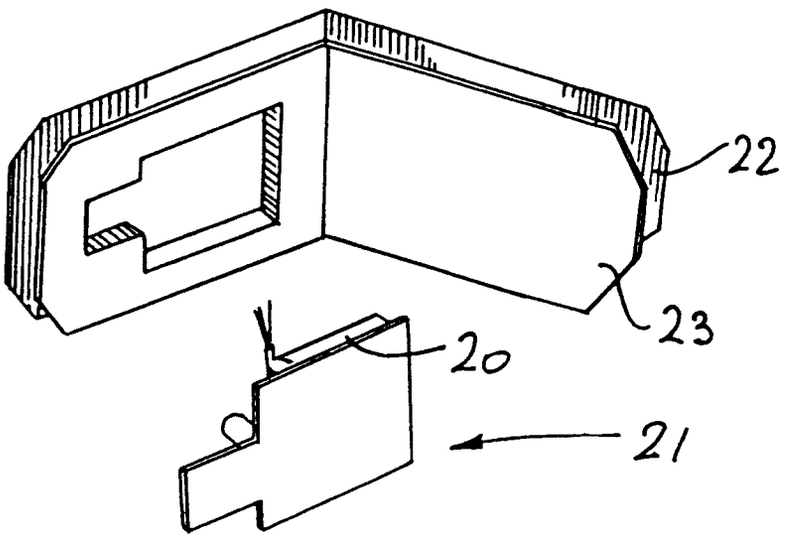


Fig.1



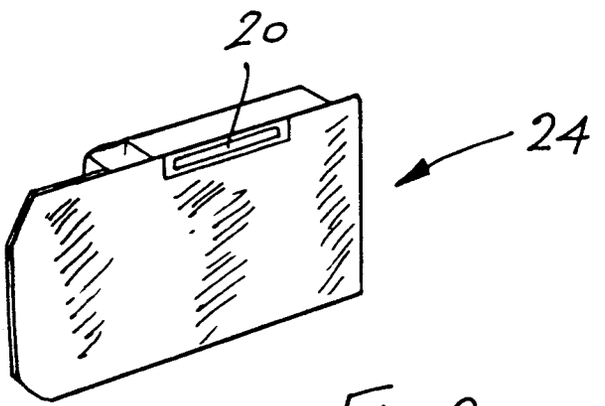


Fig. 2

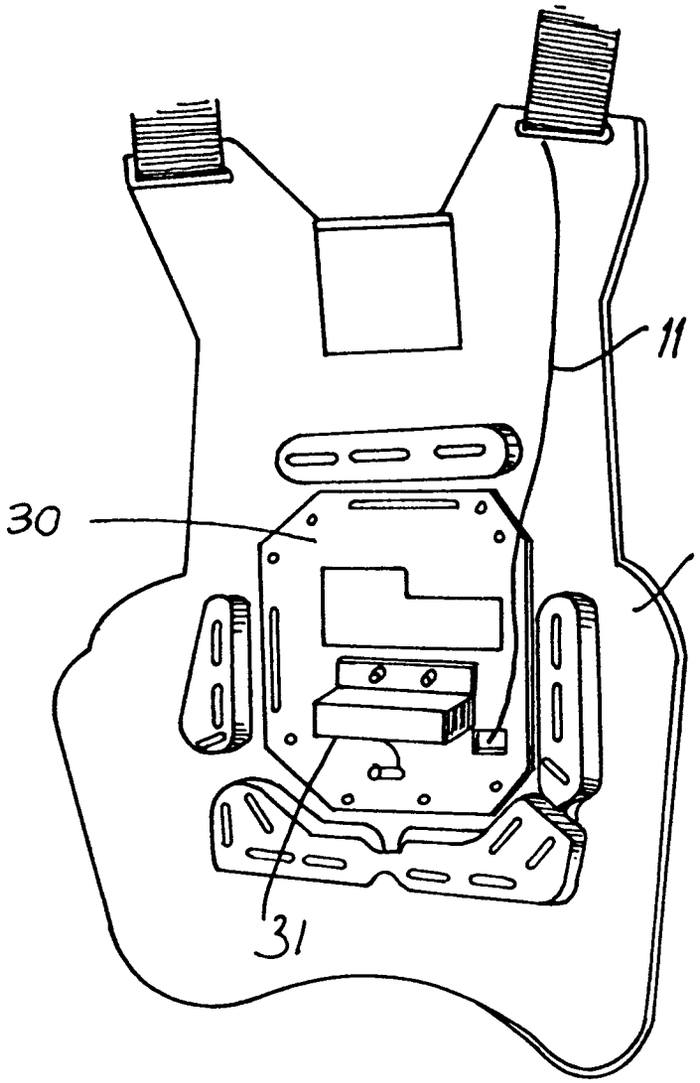


Fig. 3(a)

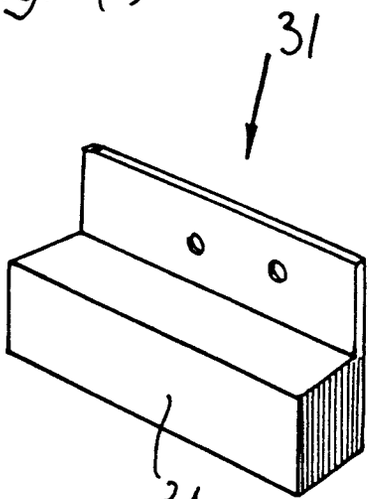


Fig. 3(b)

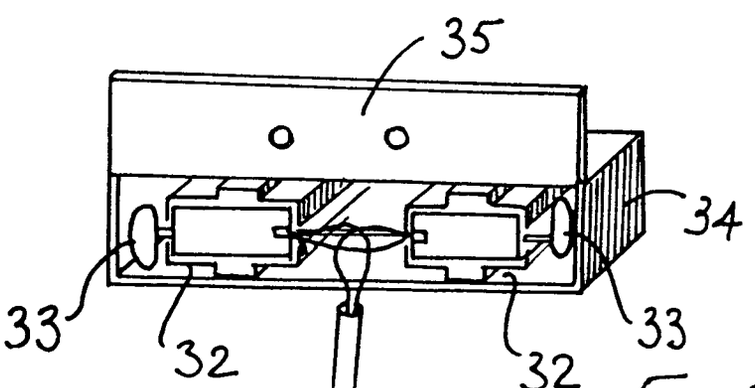


Fig. 3(c)

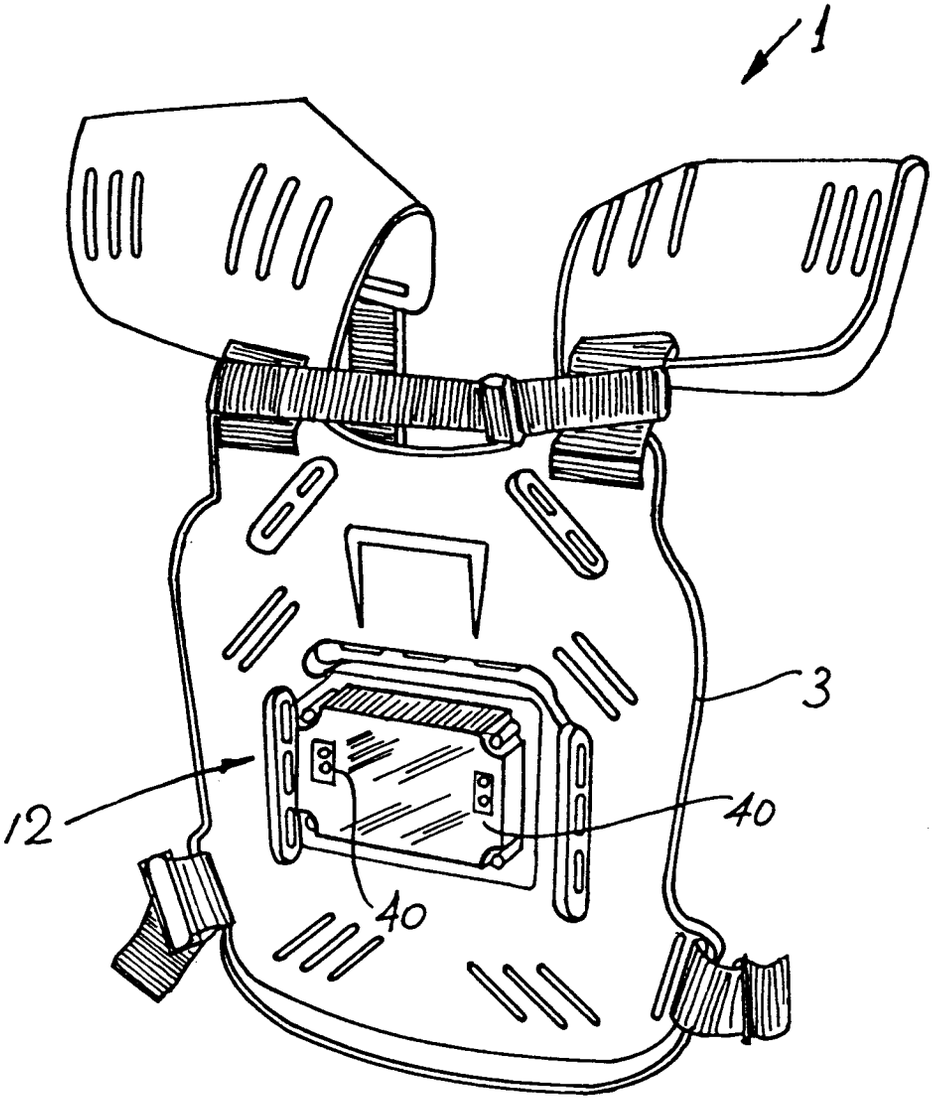


Fig.4

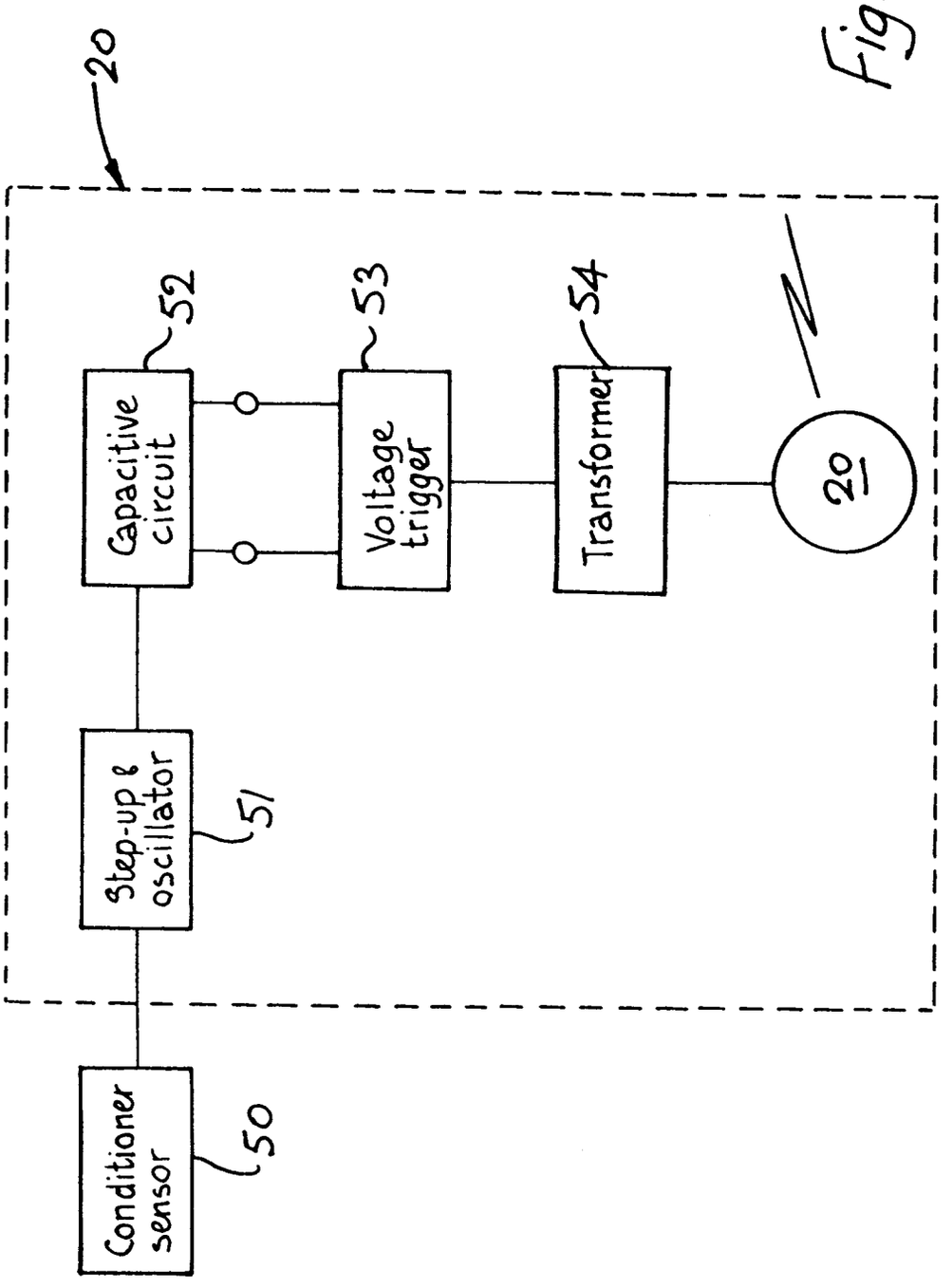

20
Conditioner sensor
50
Step-up & oscillator
51
Capacitive circuit
52
Voltage trigger
53
Transformer
54
20

Fig. 5

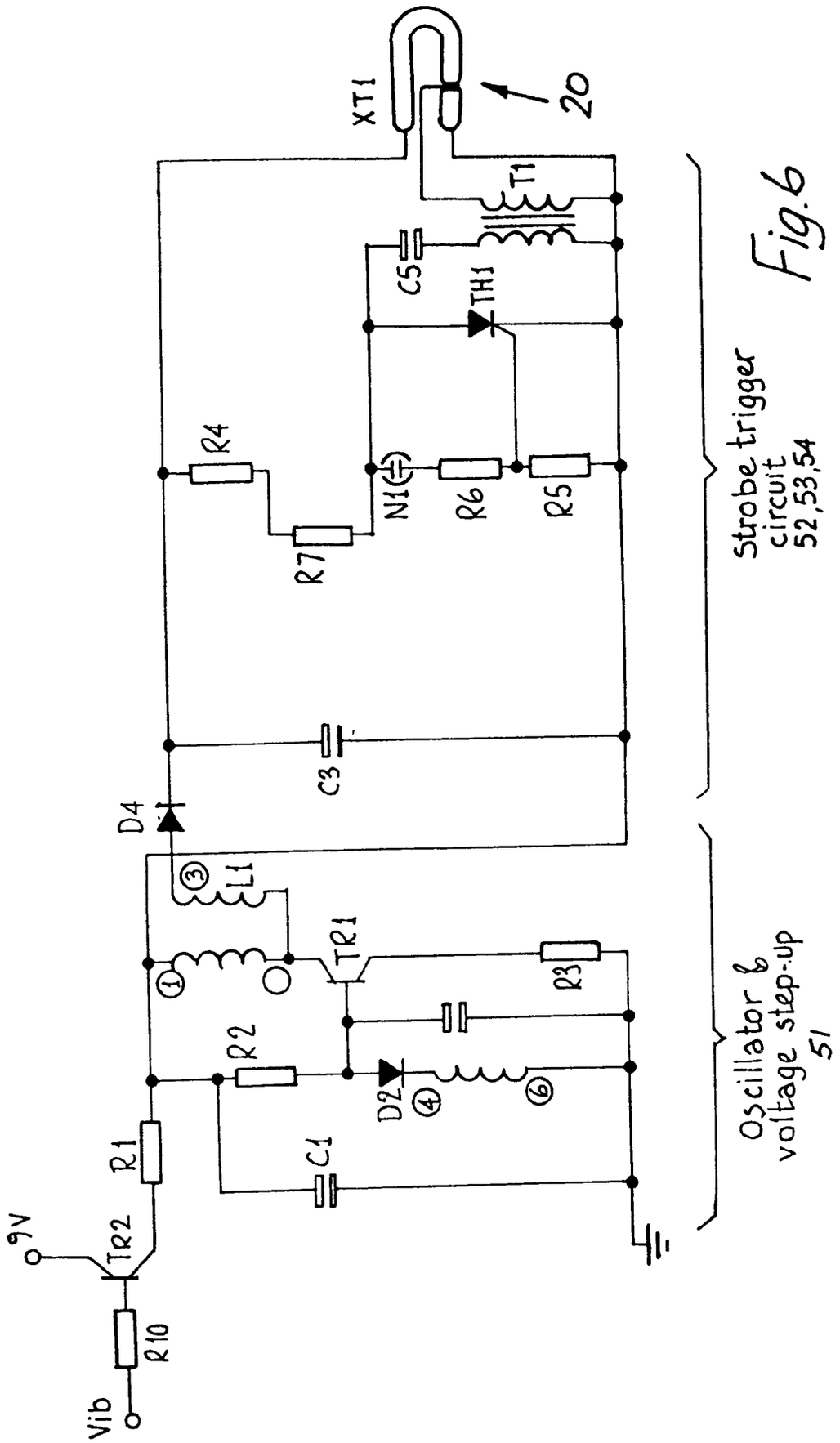

XT1
1
20
T1
C5
TH1
R4
N1
R6
R5
R7
C3
D4
L1
TR1
R3
R2
D2
C1
R1
9V
TR2
R10
Vib
Strobe trigger circuit 52,53,54
Oscillator & voltage step-up 51

Fig.6

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 94 65 0005

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
X,D	GB-A-2 216 813 (HASELHURST) * abstract * * page 4, line 1 - page 7, line 8 * * figures *	1-3,6-12	F41J5/02 F41A33/02 F41G3/26
A	WO-A-91 02210 (NOVA TECHNISCHE GERÄTE GMBH) * abstract * * page 3, paragraph 3 - page 8, paragraph 1 * * figures 8,9 *	1	
A	US-A-4 898 391 (KELLY ET AL.) * column 2, line 53 - column 3, line 16 * * figures 1-4 *	1	
A	US-A-4 586 715 (SCOLARI ET AL.) * column 2, line 47 - column 3, line 55 * * figure 7 *	1	
A,D	GB-A-2 200 732 (TOMO KOGO CO. INC.)		TECHNICAL FIELDS SEARCHED (Int.Cl.5)
A,D	EP-A-0 231 066 (FUTURISTIC SPACE TOYS INC.)		F41J F41A F41G

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	11 July 1994	Olsson, B

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
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E : earlier patent document, but published on, or after the filing date
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