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(54) **ACOUSTIC PANEL**

AKUSTISCHE PLATTE

PANNEAU ACOUSTIQUE

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(73) Proprietor: **Brown, Petter**
3222 Sandefjord (NO)

(72) Inventor: **Brown, Petter**
3222 Sandefjord (NO)

(74) Representative: **Lekova, Tatyana Boyanova**
136, Hristo Botev Boulevard
1202 Sofia (BG)

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Description

Technical field

[0001] The present invention is related to an acoustic panel used for the creation of acoustic waves in a solid body corresponding to music and/or speech and for the development of dancing floors or training platforms for hearing impaired people.

Technical Background

[0002] GB 1447588 (A) describes a dancing floor that includes at least one floor panel resiliently mounted on a firm foundation and having an electro-mechanical transducer fixed to its underside so as to convert electrical audio-frequency power supplied and modulated with dance music into mechanical vibrations. The panel may be of wood or wood composition board or of plastics. The transducer is attached to the back side of the board which is mounted on sound absorbing material surrounded by safety frames formed of rigid and resilient material respectively.

[0003] The described panel cannot reproduce mechanical vibrations that strictly correspond to the acoustic signal of the entire frequency range of acoustic signal modulation do to the positioning of a transducer (of speaker type) under the central part of the floor panel, and as a result, the resilient connection between the solid bottom and the acoustic board has constant solidity that cannot be changed when changing the frequency range of the acoustic signal.

Technical description of the invention

[0004] This invention is aimed at the development of an acoustic panel that allows more precise reproduction of acoustic signal by means of mechanical vibrations in an extended frequency range of the acoustic signal modulation.

[0005] The objective is achieved by using an acoustic panel that includes solid foundation, above which there is a board resiliently mounted on the foundation. The panel characterizes in that at the foundation there is an electrodynamic system mounted with an even number of poles created by at least one constant magnet. Around each pole a modulating coil is placed. On the foundation there are at least three support sockets fixed, each of which has an internal hole in its upper part where an elastic heel is loosely mounted which is fixed to the board, and the board is made of magnetic soft material.

[0006] In one embodiment of the acoustic panel the constant magnet is formed by segments with serial alternating poles.

[0007] In another embodiment there are four magnets forming four magnetic chains with joint poles.

[0008] In this embodiment it is appropriate to form the joint poles with a separate magnetic core around which

a modulating coil is placed.

[0009] In another embodiment of the acoustic panel in each corner of the foundation a support socket is placed with a formed internal hole in the upper part in which a loosely mounted elastic heel is placed respectively, attached to the board.

[0010] The advantages of the acoustic panel according to the invention are related to the delivery of more precise reproduction of the acoustic signal as mechanical vibrations in an extended range of the acoustic signal modulation. On the one hand, this is because of the use of additional magnetic field of constant magnets which reduces the hysteresis of the electromagnetic transducer. On the other hand, the use of a resilient heel, loosely mounted at the hole of the support socket, by supporting the board of the acoustic panel, it allows to achieve different hardness of the vibration system loaded with the human body weight over the board on the one hand, and on the other hand - with the equivalent magnetic power of the modulating impact of the acoustic signal.

Description of the attached figures

[0011]

Figure 1 is an axonometric image of the acoustic panel according to the invention;

Figure 2 is a cutaway diagram through the support socket;

Figure 3 shows the basic embodiment of the acoustic panel with one magnetic chain

Examples of particular embodiment

[0012] The acoustic panel (fig. 1 and 3) consists of a solid foundation 1 over which a board is placed (membrane) 2, resiliently mounted on the foundation 1. On the foundation there is a mounted system of at least one constant magnet 3 with poles N and S 4, around which there is a modulating coil 5. On the foundation 1 there are at least three support sockets 6 fixed, having an internal hole 7 in its upper part where a resilient heel 8 is loosely mounted.

[0013] It is possible in the area of the poles 4 to mount a separate magnetic core 9 around which a modulating core 5 is placed.

It is possible to form the constant magnets 3 with segments 20 with serial alternating poles.

[0014] In the most preferred embodiment shown in axonometry on Figure 1 the magnets 3 are four, and joint poles 4 are formed in the four tops of the system among which the magnetic core 9 is set. In this embodiment the foundation 1 and the board 2 have quadrangular shape, and square shape is preferred.

[0015] In order to assure sufficient solidity of the acoustic panel, in each corner of the foundation 1 a support socket 6 with an internal hole 7 in the upper part can be placed, where a resilient heel 8 is loosely mounted

and attached on the board 2.

Use of the invention

[0016] The acoustic panel according to the invention is used to develop dance floors suitable for hearing impaired and deaf people. The panel is also suitable for training or educational purposes for the same group of people, e.g. a seat, back of a chair or similar tools.

[0017] On supplying electrical signal that is frequency and amplitude modulated with any acoustic signal (for example, music or speech), at the coils 5 of the electrodynamic system, in the magnetic core 9 alternating magnetic field is generated which combined with the magnetic field of the constant magnets 3 is closed through the magnetic soft board 2 and creates forces of attraction or repulsion of the board 2 towards the magnetic core 9, and thus it forces vibrations of the board 2 in two directions with respect to the static condition of the platform when the acoustic panel is loaded with a person in conformity with the amplitude and the frequency of the acoustic signal.

[0018] When the board 2 moves downwards towards the foundation 1 under the force of one half wave of the amplitude-frequency modulated signal, as a result of the filled looseness between the heel 8 and the socket 6 because of the deformation of the resilient heel 8, the system hardens and the board 2 vibration is in conformity with the high-frequency component of the acoustic signal. Alternatively, the board moves upwards from the foundation 1 under the force of the other half wave of the amplitude-frequency modulated signal, as a result of created looseness between the heel 8 and the socket 6, the system softens and reproduces a low-frequency component (part) of the acoustic signal.

Claims

1. An acoustic panel that consists of a solid foundation (1) on which a board (2) is placed **characterised in that** the board is resiliently mounted on the foundation and at the foundation (1) electrodynamic system is mounted with an even number of poles (4), formed by at least one constant magnet (3), and around each pole (4) there is a modulating coil (5), and at the foundation (1) there are at least three support sockets (6) fixed, and each of them has an internal hole (7) in its upper part where there is a loosely mounted resilient heel (8) attached to the board (2), and the board is made of magnetic soft material.
2. An acoustic panel according to claim 1, **characterized in that** the constant magnets (3) are formed by segments (10) with serial alternating poles.
3. An acoustic panel according to claim 1, **characterized in that** the magnets (3) are four in number and

they form four magnetic chains with joint poles (4).

4. An acoustic panel according to claim 3, **characterized in that** the joint poles (4) are formed by a separate magnetic core (9), around which a modulating coil is placed (5).
5. An acoustic panel according to claims 1-4, **characterized in that** on each corner of the foundation (1) a support socket is mounted (6) with an internal hole (7) in its upper part in which a resilient heel (8) is loosely mounted and is attached to the board (2).

Patentansprüche

1. Eine Akustikplatte, die aus einem festen Fundament (1) besteht, auf dem ein Brett (2) platziert ist, und durch Folgendes charakterisiert ist: Das Brett (2) ist federnd auf dem Fundament montiert, am Fundament (1) ist ein elektrodynamisches System mit einer geraden Anzahl an Polen (4) montiert, die von mindestens einem Permanentmagneten (3) gebildet werden. Um jeden Pol (4) ist eine modulierende Spule (5) angebracht, und am Fundament (1) sind mindestens drei Stützsockel (6) befestigt, je mit einer Innenbohrung (7) im oberen Teil, in der sich ein lose montierter federnder Zapfen (8) befindet, der am Brett (2) befestigt ist. Das Brett besteht aus weichmagnetischem Material.
2. Eine Akustikplatte gemäß Anspruch 1, die durch Folgendes charakterisiert ist: Die Permanentmagnete (3) werden durch Segmente (10) mit seriellen wechselnden Polen gebildet.
3. Eine Akustikplatte gemäß Anspruch 1, die durch Folgendes charakterisiert ist: Es sind insgesamt vier Magnete (3) vorhanden, die vier Magnetketten mit verbundenen Polen (4) bilden.
4. Eine Akustikplatte gemäß Anspruch 3, die durch Folgendes charakterisiert ist: Die verbundenen Pole (4) werden durch einen separaten Magnetkern (9) gebildet, um den eine modulierende Spule (5) angebracht ist.
5. Eine Akustikplatte gemäß den Ansprüchen 1 bis 4, die durch Folgendes charakterisiert ist: An jeder Ecke des Fundaments (1) ist ein Stützsockel (6) mit einer Innenbohrung (7) in seinem oberen Teil montiert, in der ein federnder Zapfen (8) lose montiert ist, der am Brett (2) befestigt ist.

Revendications

1. Un panneau acoustique composé d'une couche so-

lide (1) sur laquelle repose une membrane (2) flottante constitué d'un matériau magnétique doux, ainsi qu'un système électrodynamique constitué d'au moins un aimant constant (3) et comportant un nombre pair de pôles (4) autour desquels figure une bobine de modulation (5) ; la couche solide (1) se caractérise également par un minimum de trois supports (6) fixes dotés chacun d'un orifice interne (7) dans sa partie supérieure où vient se loger un talon (8) flottant rattaché à la membrane (2).

2. Un panneau acoustique conformément à la revendication 1, **caractérisé par le fait que** les aimants constants (3) soient formés par des segments (10) avec alternance en série des pôles.
3. Un panneau acoustique conformément à la revendication 1, **caractérisé par le fait que** les aimants constants (3), au nombre de quatre, forment quatre chaînes magnétiques avec des pôles communs (4).
4. Un panneau acoustique conformément à la revendication 1, **caractérisé par le fait que** les pôles communs (4) sont formés par un noyau magnétique (9) distinct autour duquel est placée une bobine de modulation (5).
5. Un panneau acoustique conformément aux revendications 1 à 4, **caractérisé par** le montage, à chaque coin de la couche solide (1), d'un support (6) doté d'un orifice interne (7) en sa partie supérieure, dans lequel repose un talon (8) flottant rattaché à la membrane (2).

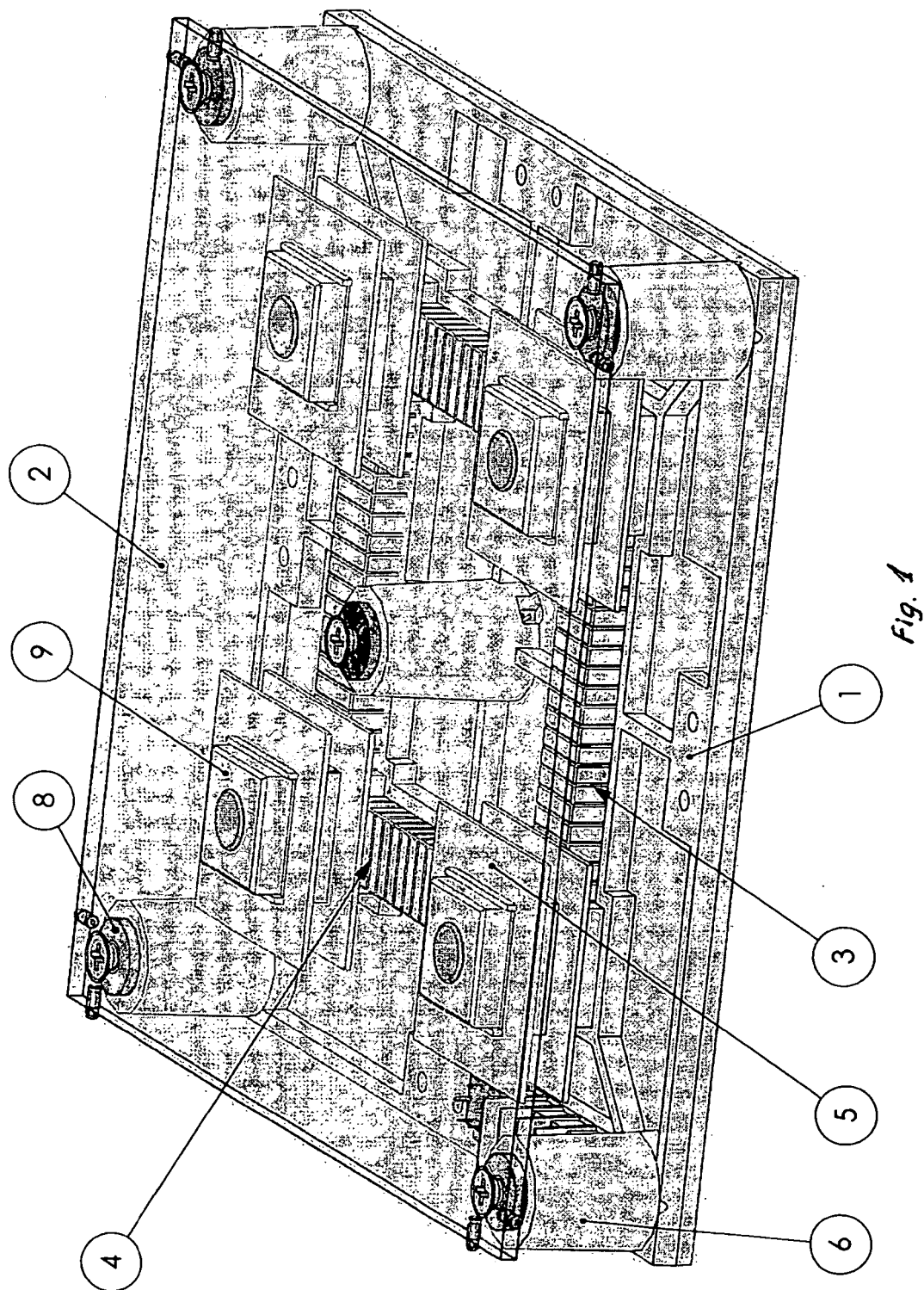
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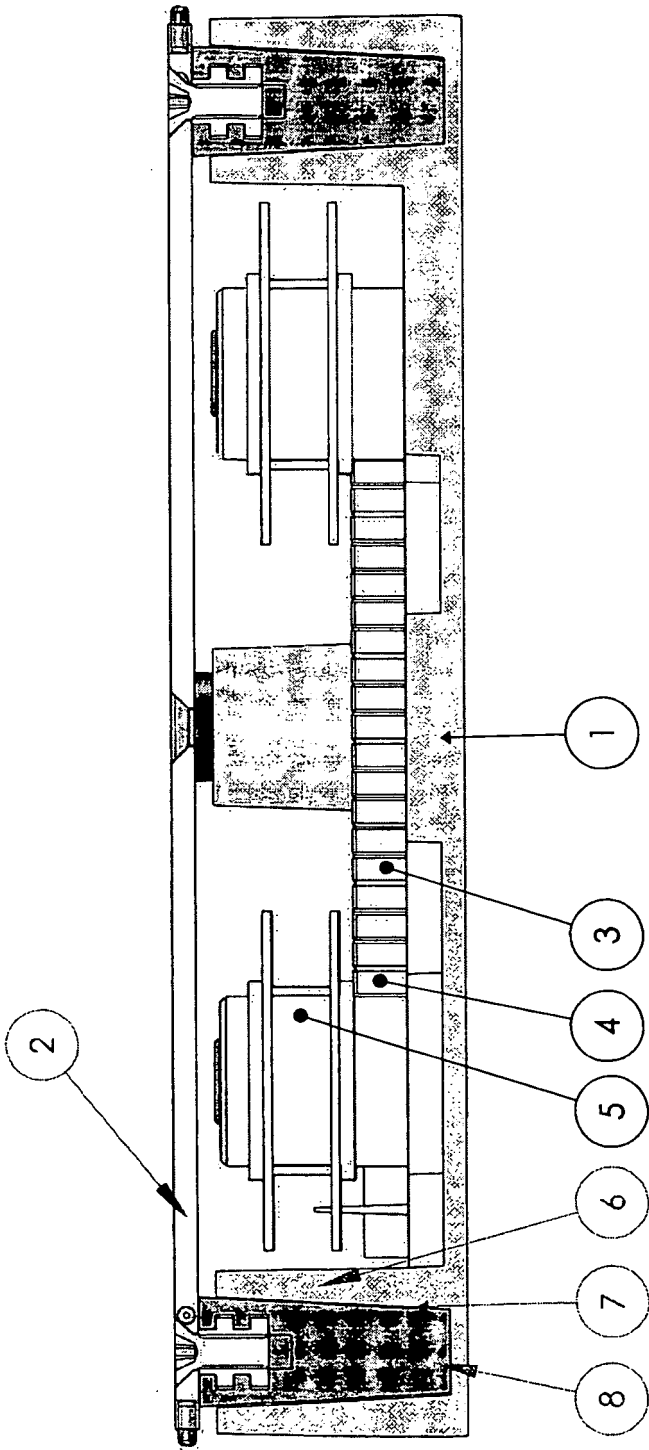


Fig. 2

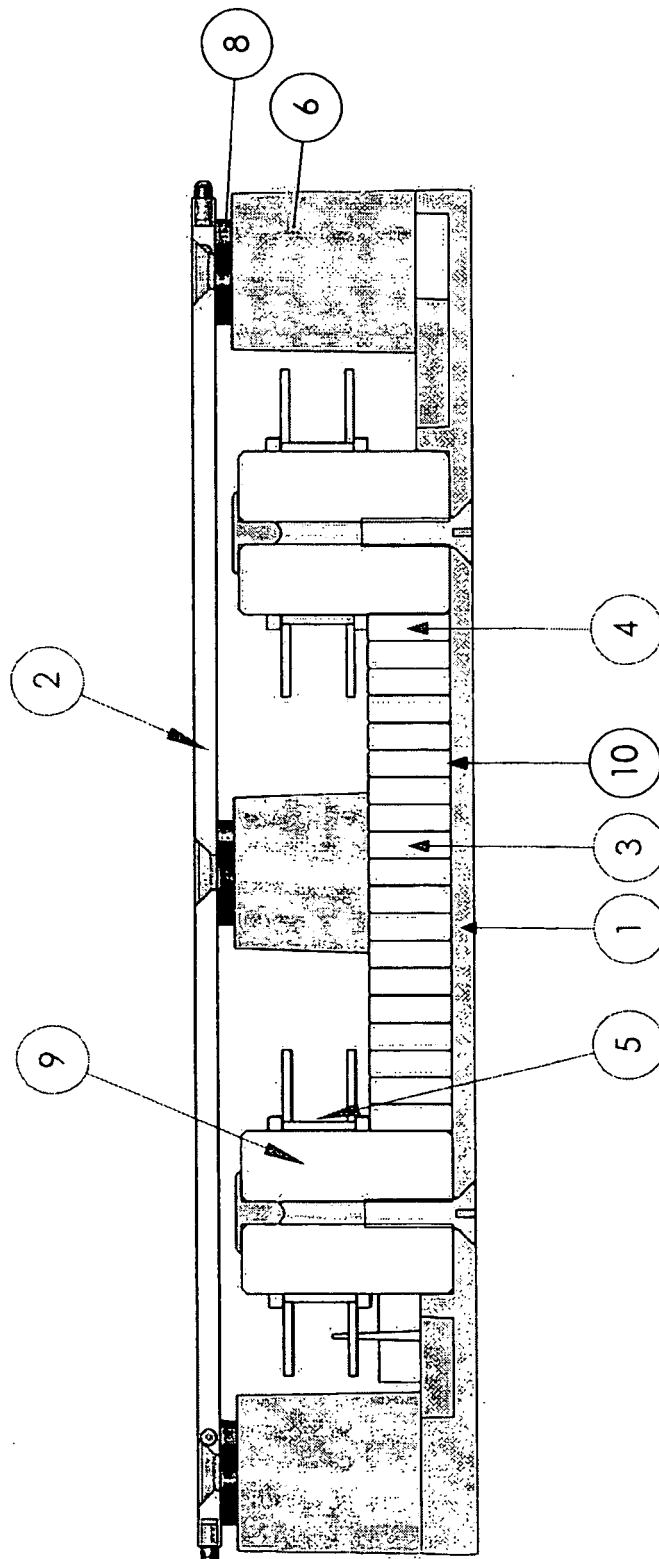


Fig. 3

REFERENCES CITED IN THE DESCRIPTION

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