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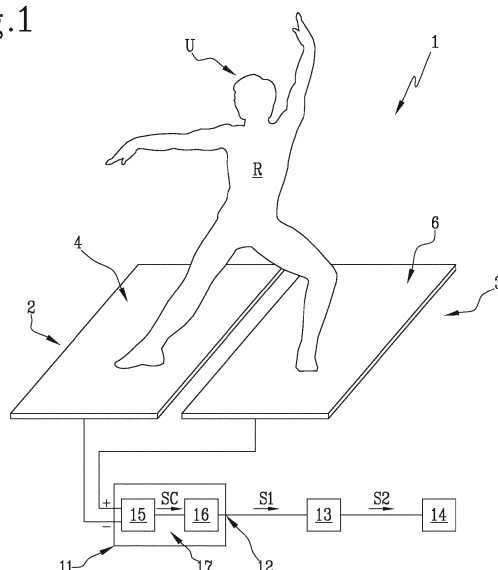
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(54) **A SYSTEM FOR GENERATING A SOUND BY DANCING.**

(57) Described is a system for generating a sound comprising a first mat (2) comprising a first electrically-conductive layer (4) and a first electrically insulating layer (5) coupled to each other and a second mat (3) comprising a second electrically-conductive layer (6) and a second electrically insulating layer (7) coupled to each other; the first and second electrically-conductive layers (4, 6) are electrically insulated from each other and the system for generating a sound comprises an interface (11) having an positive input pole (+) in communication with the first electrically-conductive layer (4) and a neg-

ative input pole (-) in communication with the second electrically-conductive layer (6); the interface is configured for generating a digital signal (S1) corresponding to a musical note as a function of an electrical resistance (R) measured between the first electrically-conductive layer (4) and the second electrically-conductive layer (6); the system for generating a sound comprises a processing unit (13) in communication with a digital output (12) of the interface (11) for receiving the musical note and configured to associate a sound to the musical note.

Fig.1



Description

[0001] This invention relates to a system for generating a sound and in particular a system, mainly designed for dance, for generating sounds correlated with dancing.

[0002] In the world of dance, both classic and modern, it is currently very difficult to develop shows which differ considerably from others since one works mainly on the styles of the dance itself and not on other aspects.

[0003] For this reason, the need to develop different and attractive shows in the dance sector also remains unsatisfied for the dancers themselves.

[0004] In this context, the aim is to develop a system for generating a sound which allows the performance of shows which are significantly different from prior art shows.

[0005] In particular, the aim of the invention is to provide a system for generating a sound which allows a real change of perspective in dance shows.

[0006] This aim is achieved by a system for generating a sound comprising the technical features described in one or more of the accompanying claims. The dependent claims correspond to possible different embodiments of the invention.

[0007] Further features and advantages of the invention are more apparent in the non-limiting description which follows of a preferred embodiment of a system for generating a sound.

[0008] The description is set out below with reference to the accompanying drawings which are provided solely for purposes of illustration without restricting the scope of the invention and in which:

- Figure 1 illustrates a schematic view partly in blocks of a system for generating a sound according to the invention;
- Figure 2 illustrates a schematic cross-section view of a detail of a first embodiment of a system for generating a sound according to the invention;
- Figure 3 illustrates a schematic cross-section view of a detail of a second embodiment of a system for generating a sound according to the invention.

[0009] With reference to Figure 1, the reference numeral 1 denotes in its entirety a system for generating a sound.

[0010] The system comprises, in the example illustrated, a mat 2 and a mat 3. The mat 2 and the mat 3 are preferably equal to each other, at least in terms of the architecture.

[0011] The mat 2 comprises an electrically-conductive layer 4 and at least one electrically insulating layer 5 coupled to each other.

[0012] The mat 3 comprises an electrically-conductive layer 6 and at least one electrically insulating layer 7 coupled to each other.

[0013] The layers 4 and 6 are coupled, respectively, to the layers 5 and 7, for example by gluing or the like.

[0014] The layers 4 and 6 of the two mats 2 and 3 are electrically insulated from each other.

[0015] According to a preferred embodiment, the layers 4 and 6 are made of conductive rubber and comprise, for example, a polymeric matrix 8, preferably elastomeric, charged with an electrically-conductive material 9, for example graphite.

[0016] The electrically insulating layer 5 and/or the electrically insulating layer 7 are made, for example, of rubber.

[0017] According to an example, the layer 5 and/or the layer 7 are made of high-density rubber with a thickness of 5 mm.

[0018] According to an example, the layer 5 and/or the layer 7 comprise a bottom support made of PVC reinforced with glass fibre.

[0019] According to an example, the layer 5 and/or the layer 7 are made of elastomer with a thickness of 5 mm.

[0020] According to an example, the layer 5 and/or the layer 7 comprise PVC.

[0021] According to an embodiment illustrated for example in Figure 3, the layer 5 and the layer 7 are made as a single body to form a platform 10 on which the electrically-conductive layers 4 and 6 are applied.

[0022] In use, the mats 2 and 3 are positioned in such a way that the electrically insulating layers 5, 7 rest on a floor or on a supporting surface and the layers 4 and 6 face upwards. In practice, the layers 5 and 7 form a underlayer of the mats 2 and 3.

[0023] At least in use, the layers 4 and 6 are positioned relative to each other in such a way that a user U, preferably a dancer, can simultaneously touch the electrically-conductive layer 4 and the electrically-conductive layer 6 carrying them into electrical contact and defining an electrical resistance R between the layers 4 and 6. The electrical resistance R depends on the physical characteristics of the user U and how he/she rests and/or how he/she moves on the mats 1 and 2, for example with the hands, feet or body.

[0024] The layers 5 and 7 must isolate the layers 4 and 6 from the surrounding environment in such a way that the electrical connection between the layers is determined exclusively by the user U.

[0025] Preferably, the layers 5 and 7 are made of a material whose moisture absorption at saturation is less than 0.8%, preferably less than 0.5%, that is to say, materials commonly known as non-hygroscopic materials, so as to minimise the absorption of water in them and maintain the insulating effect at least between the layers 4 and 6 and the surrounding environment.

[0026] In general, the mats 2 and 3 must provide a good elastic response to stresses and protect from injuries and excessive muscle fatigue or anti-traumatic strain the individuals who intends to use the system 1 and in particular to carry out dance routines. According to alternative embodiments, the insulating layer may be multi-layer, that is to say, it comprises two or more layers coupled to each other on the basis of the performance ex-

pected from the mats 2 and 3.

[0027] The system 1 comprises an interface 11 having an analogue input, indicated in the drawing with the polarities "+" and "-", and a digital output 12.

[0028] The analogue inlet comprises a positive pole "+" electrically connected to the layer 4 of the mat 2 and a negative pole "-" electrically connected with the layer 6 of the belt 3.

[0029] The mat 2, in particular the layer 4, and the mat 3, in particular the layer 6, define electrodes of the system 1.

[0030] The interface 11 is configured to generate a digital signal S1 corresponding to a musical note as a function of the electrical resistance R measured, the layer 4 and the layer 6.

[0031] In practice, the signal S1 depends on how the user U occupies and connects the mats 2 and 3 to each other electrically.

[0032] The system 1 comprises a processing unit 13 in communication with the digital output 12 of the interface 11 for receiving the signal S1, that is, the musical note.

[0033] The signal S1 may be, for example, sent to the processing unit 13 using a USB interface. The processing unit 13 is configured to associate a sound S2 with the musical note; the sound S2 may be reproduced, for example, by means of a virtual instrument 14.

[0034] According to the preferred embodiment, the interface 11 is a MIDI interface and the digital signal S1 is a MIDI signal.

[0035] The MIDI signal S1 may also be used to control stage lights using a processing unit, for example the same processing unit 13, suitably configured.

[0036] Schematically, the MIDI format comprises the interface and software protocols for generating music; the interface 11 sends MIDI signals which are read by musical software, present in the processing unit 13, which reproduces it with any selected sound.

[0037] The musical software, resident in the processing unit 13, can reproduce the notes by means of virtual instruments, for example with the sound of an oboe or a violin, by means of a synthesiser or a sampling of a recorded sound which is started by means of a predetermined note.

[0038] The MIDI standard is a musical transcription standard; a MIDI file or message, referred to as signal S1, contains a series of information that a computer or an electronic keyboard or the like, such as the processing unit 13, reads and transforms into a note which is played, for example, by means of a synthesised or sampled sound, using the virtual instrument 14. In the system 1, the MIDI signals are generated through the two electrical contacts, defined by the layers 4 and 6, reading the resistance R.

[0039] When the contacts 4 and 6 are closed, the resistance value seen by the input of the interface 11 changes and it generates a note with a different level or different notes as a function of the resistance R.

[0040] The system 1 is therefore able to transcribe into music the movements of the user U, in particular of a dancer.

[0041] In effect, the dancer, or the dancers, act as an electric bridge between the mats 2 and 3 imposing on the system the resistance R which varies on the basis of the movements of the dancer him/herself, thus generating diversified sounds.

[0042] By closing the circuit in any way, the level of electrical resistance R is different and a note of a different height is generated.

[0043] Increasing or decreasing the surface of the body which comes into contact with the electrodes, or contact surface, varies the electrical resistance and the note therefore becomes higher or lower based on the resistance.

[0044] The electrical resistance and the musical note therefore depend on a dynamics of the user who determines the contact surface between the body and the mats 2 and 3.

[0045] For example, the greater the contact surface, the lower is the electrical resistance R of the circuit and the greater is the intonation of the note generated.

[0046] For example, if the dancer touches the layers 4 and 6 with the tips of the feet a low note is generated, if pressed with all the foot the note rises, if the dancer lies with the body across the mats the note becomes even higher.

[0047] Each electrical resistance corresponds to a single note; once the note generated is sent to the processing unit, it is possible to decide how to use it.

[0048] For example, filters may be applied to raise or lower it, depending also on which instrument is selected to play the note. For example, it is possible to raise a low note which is to be played by a clarion.

[0049] The interface 11 may comprise, for example, schematically, a digital analogue converter 15 which defines the analogue input. The converter 15 is configured for sampling an analogue voltage signal, as a function of the electrical resistance R between the layer 4 and the layer 6, and to provide a sample signal SC. The interface 11 comprises a microprocessor 16, in communication with the converter 15, for receiving as input the sample signal SC. The microprocessor 16 is configured for generating the digital signal S1 as a function of the sample signal SC and therefore of the resistance R.

[0050] Preferably, the microprocessor 16 and the converter 15 are integrated in a microcontroller 17.

[0051] The solution as described herein brings important advantages. The system described allows the dancer to create the music without always being forced to follow one. It is possible to set up shows which are completely different from prior art shows since traditional situations can be combined with others diametrically opposite each other. It completely changes the perspective compared with prior art shows; it is no longer the music or it is not just the music that guides the dance but it is the dancer who can compose a symphony with the

dance; the dancer creates movement and music.

Claims

1. A system for generating a sound comprising

a first mat (2) comprising a first electrically-conductive layer (4) and at least a first electrically insulating layer (5) coupled to each other;
a second mat (3) comprising a second electrically-conductive layer (6) and at least a second electrically insulating layer (7) coupled to each other, said first and second electrically-conductive layers (4, 6) being electrically insulated from each other, said system for generating a sound comprising at least one interface (11) having an analogue input and a digital output (12), said analogue input comprising a positive pole (+) in communication with said first electrically-conductive layer (4) and a negative pole (-) in communication with said second electrically-conductive layer (6), said interface (11) being configured to generate a digital signal (S1) corresponding to a musical note as a function of an electrical resistance (R) measured between said first electrically-conductive layer (4) and said second electrically-conductive layer (6), said system for generating a sound comprising a processing unit (13) in communication with the digital output (12) of said interface (11) for receiving said musical note, said processing unit (13) being configured to associate at least one sound to the musical note, in use said first and second electrically-conductive layers (4, 6) being positioned relative to each other in such a way that at least a user (U) can simultaneously touch the first electrically-conductive layer (4) and the second electrically-conductive layer (6) defining said electrical resistance (R) between said first electrically-conductive layer (4) and said second electrically-conductive layer (6).

2. The system for generating a sound according to claim 1, wherein said first electrically-conductive layer (4) and/or said second electrically-conductive layer (6) comprises a polymeric matrix (8) charged with an electrically conductive material (9).

3. The system for generating a sound according to claim 1 or 2, wherein said first electrically insulating layer (5) and/or said second electrically insulating layer (7) comprises rubber.

4. The system for generating a sound according to any one of the preceding claims, wherein said first electrically insulating layer (5) and/or said second electrically insulating layer (7) comprises PVC.

5. The system for generating a sound according to any one of the preceding claims, wherein said first mat (2) and said second mat (3) are equal to each other.

6. The system for generating a sound according to any one of the preceding claims, wherein said interface (11) comprises:

a digital analogue converter (15) defining said analogue input and configured for sampling an analogue voltage signal, as a function of said electrical resistance (R), and providing a sample signal (SC);
a microprocessor (16) in communication with the digital analogue converter (15) for receiving as input said sample signal (SC) and configured for generating said digital signal (S1) as a function of said sample signal (SC).

7. The system for generating a sound according to claim 6, wherein said interface (11) comprises a microcontroller (17) comprising at least said digital analogue converter (15) and said microprocessor (16).

8. The system for generating a sound according to any one of the preceding claims, wherein said interface (11) is a MIDI interface and said digital signal (S1) is a MIDI signal.

9. The system for generating a sound according to any one of the preceding claims, wherein said first electrically insulating layer (5) and said second electrically insulating layer (7) are made in a single body to form a platform (10), said first and second electrically conductive layers (4, 6) being coupled to said platform (10).

10. The system for generating a sound according to any one of the preceding claims, wherein said first electrically insulating layer (5) and/or said second electrically insulating layer (7) are multi-layer.

11. A method for generating at least one sound by means of a system for generating a sound according to any of claims 1 to 10, comprising a step of electrically connecting said first electrically-conductive layer (4) and said second electrically-conductive layer (6) by means of an electrical bridge, said electrical bridge consisting of at least one user (U) of said system for generating a sound.

12. The method for generating at least one sound according to claim 11 wherein the user (U) imposes to the system for generating a sound said resistance (R) based on its own movements which determine a contact surface between the user (U) and the first and second mats (2, 3).

Fig.1

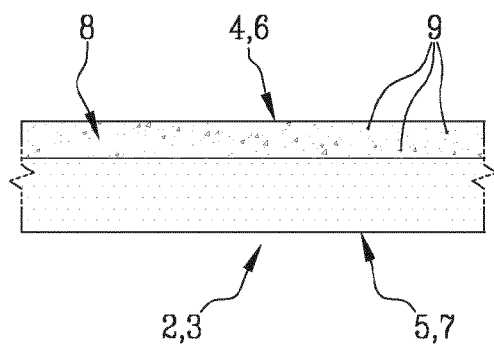
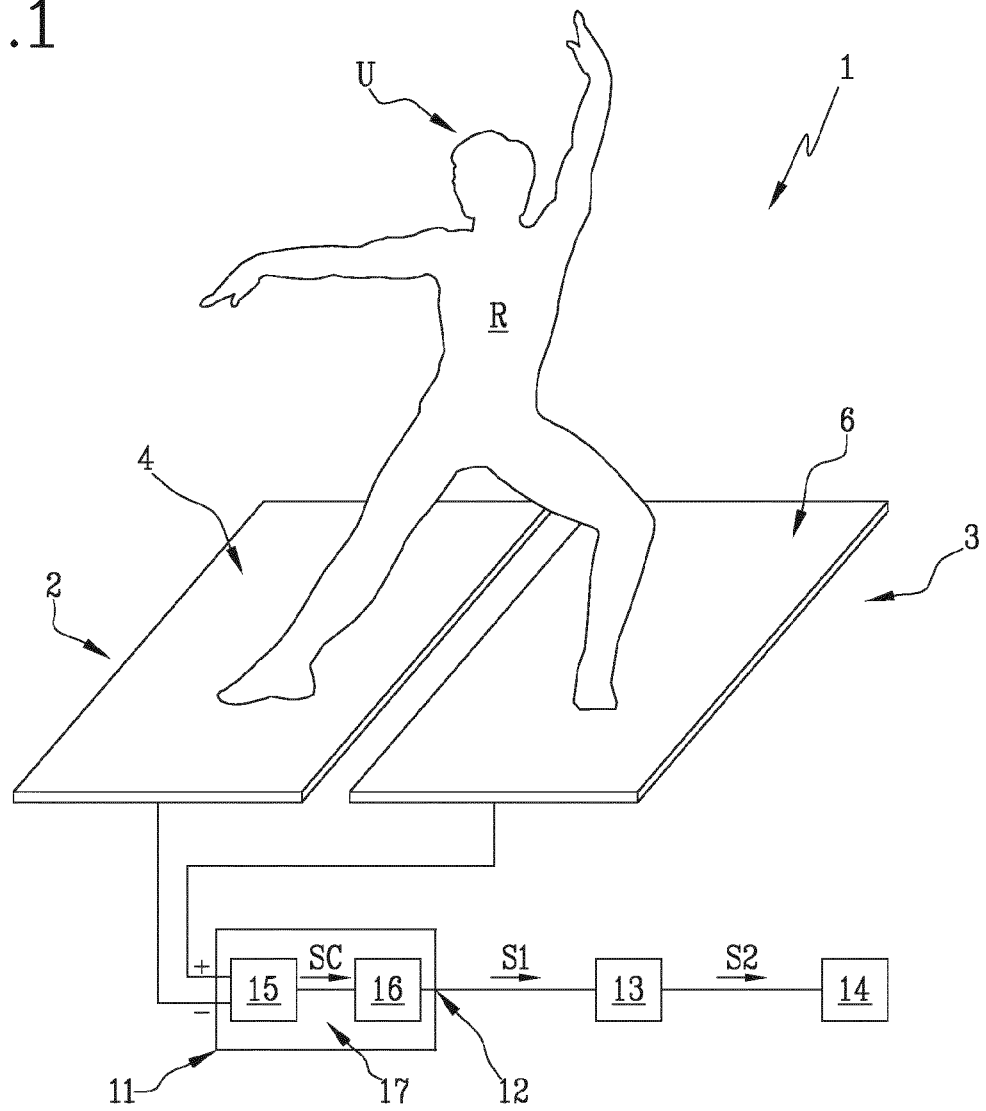


Fig.2

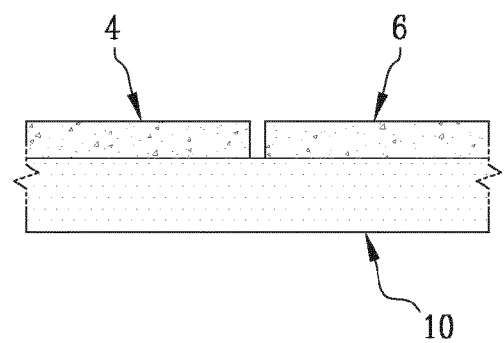


Fig.3



EUROPEAN SEARCH REPORT

Application Number

EP 23 15 2135

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EPO FORM 1503 03.82 (P04C01)

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Place of search Munich		Date of completion of the search 21 June 2023	Examiner Glasser, Jean-Marc
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 23 15 2135

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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