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(54) **ACCORDION, PREFERABLY A DIATONIC BUTTON ACCORDION**

(57) An accordion, particularly a diatonic button accordion, comprising a treble casing, a bass casing, and a bellows arranged therebetween, wherein buttons for playing the accordion are arranged on both the treble casing and the bass casing, said buttons being connected with a respective pallet via a mechanism of levers, said pallet closing an opening in the bottom of a reed block comprising reed plates, wherein it comprises an assembly comprising a bottom formed of superimposed panels with openings, and reed blocks that are arranged on this bottom parallel to each other, wherein all reed blocks share a common bottom.

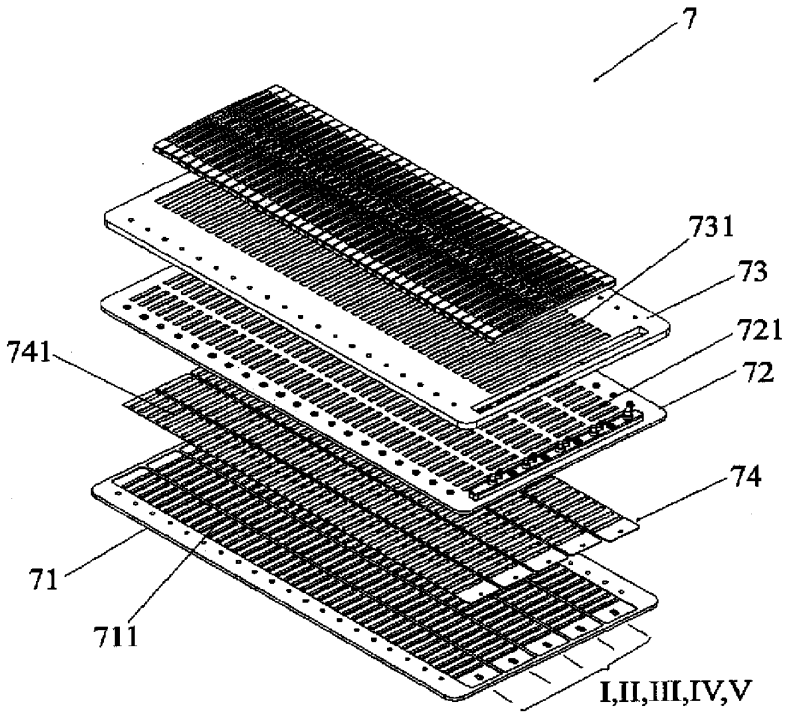

Fig. 3

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Description

Object of Invention

[0001] The object of the invention is an accordion, preferably a diatonic button accordion.

Technical Problem

[0002] The technical problem is to conceive an accordion, preferably a diatonic button accordion, which will allow a musician to play the accordion with various pitches without having to change the accordion, wherein the accordion will be conceived entirely mechanically. The accordion thus conceived must preserve the shape and dimensions of a conventional diatonic button accordion on one hand and the mode of playing it on the other.

Prior Art

[0003] The accordion, and also the diatonic button accordion, has a treble casing and a bass casing mutually joined by a bellows. When the bellows is pulled or pushed, the air is pushed through valves and reed blocks to reed plates and reeds, the latter vibrate at a particular frequency, thus creating a certain tone. If the tone changes in dependence on the bellows being pushed or pulled, a diatonic button accordion is in question. The treble casing is arranged on the right side of the bellows and usually has three and even up to five rows of buttons intended to play a melody. The bass casing is arranged on the left side of the bellows and usually has eleven buttons (a three-row accordion), with which bass sounds are produced, and five chord buttons. The principle of operation and tone creation is identical on the treble and bass sides, the difference being particularly in the number of buttons. The treble and bass casings are usually made of wood.

[0004] The treble casing contains reed blocks, the number of which depends on the number of buttons and is at least identical to the number of rows of the buttons on the treble side. The bass casing also contains reed blocks; one reed block is meant for all bases, while the other reed block is meant for all accompanying chords. One reed block inside the treble casing is assigned to one row of buttons on the treble side, wherein each reed block is tuned in a certain major scale. The treble casing having three rows of buttons, which is a total of 40 buttons, contains three reed blocks, each tuned in its certain major key. As a result, each diatonic button accordion is tuned in a certain major key combination, such as CFB, FisHE, FBEs, HEA, GCF and others. An accordion with several rows of buttons is tuned in a more extended major key combination.

[0005] An individual reed block comprises a carrier housing with compartments, in which reed plates are arranged, a bottom panel closing the housing, and a single-layer bottom containing slots for reed plates. Each individual button on the treble side, for instance, is connected with a pallet via special mechanism of levers. When a button is pushed, the pallet closing the slots in the bottom of the reed block lifts and allows the air to reach the reed plates. The reed blocks normally have three slots which are arranged in the bottom of the reed block substantially in the form of a triangle and closed by the same treble pallet. Such a reed block has three reed plates which all produce the same sound yet with a different timbre, this is what we call a three-voiced accordion. Each reed plate comprises a housing with two longitudinally parallel slots. Each slot is closed at one side by a metallic reed to produce a sound and at the other side by a valve, for instance felt or leather, to prevent the air from reaching the reed from below. Three identically arranged reeds of three reed plates belonging to one treble pallet produce an identical sound yet with a different timbre.

[0006] When the accordion is played, the reed block in the casing is arranged substantially vertically, such that the bottom of the reed block faces the buttons on the treble/bass side, the reed plates with reeds are arranged perpendicularly to the bottom, in fact, while the accordion is played, they are arranged substantially parallel to the direction of the bellows being expanded/compressed.

[0007] Musicians - accordionists use variously voiced accordions when performing different melodies either due to the requirements of the musical notation or because they prefer a certain timbre. Since an accordion can only be tuned in one way, i. e. in a particular major combination, the accordionist must have several variously tuned accordions to perform melodies. The accordionist must thus switch between accordions during a performance, which is time consuming, especially if the accordionist has the accordion fastened to a carrier belt to ease playing. Such interruptions are not desired because they interrupt a performance.

[0008] Each accordion must be well broken in; this means that an accordionist must play each accordion for a certain minimum number of hours. If an accordionist has several accordions, the breaking-in may pose a problem because certain accordions are used more frequently than the others.

[0009] The economical aspect of playing a large number of accordions is also not to be neglected; an accordion is, in fact, quite a considerable cost for an individual.

[0010] It is therefore evident that there is a need for such a diatonic button accordion that would be tuned in more than one major combination, wherein such tuning would be carried out only mechanically without use of any electronic devices. The mechanical way of doing it is important because a diatonic button accordion is a historical, folk instrument intended predominantly to play folk songs that call for an adequate mechanical sound.

Solution to the Technical Problem

[0011] The technical problem is solved by the diatonic

button accordion of the invention, the main characteristic of which is an assembly comprising a bottom formed of superimposed panels with openings, and reed blocks that are arranged on this bottom parallel to each other, wherein all reed blocks share a common bottom. The assembly comprises more than one reed block, preferably twenty reed blocks.

[0012] The bottom is formed of a bottom panel provided with openings, wherein the openings are arranged in five mutually parallel arrays, wherein each array comprises forty openings, a middle panel provided with openings that match the openings of the bottom panel, an upper panel provided with rectangular openings arranged parallel to each other in one array and perpendicularly to the longitudinal extension of the upper panel, wherein the size of each opening corresponds to the sizes of the openings arranged in the same row of all five arrays, a panel arranged between the bottom panel and the middle panel and formed of five parallel perforated metallic bands arranged next to each other, wherein the perforations are arranged in a way to match the intermediate compartments between the openings.

[0013] A reed block is substantially flat and has a rectangular shape, the width of which corresponds to the width of the bottom, said reed block comprising a fastening portion with openings that match the openings of the bottom panel, and a flat carrier portion, on which reed plates are fastened. The fastening portion contains two mutually parallel arrays of five openings that match the openings of the bottom panel.

[0014] A reed block has chambers arranged in the carrier portion, which are closed by reed plates. The chambers of a reed block on one face of the carrier portion of the reed block are larger than the chambers on another face of the carrier portion of the reed block.

[0015] A reed plate has three reeds and three closing elements, what allows triple tuning. The reed plates located within the same array are tuned in three major keys. The reed plates located in various arrays are tuned in various combinations of major keys.

[0016] In its form, the pallet matches the opening and abuts on it.

[0017] Each perforated metallic band is connected via tuning mechanism of levers with a tuning button arranged on the casing.

[0018] The diatonic button accordion of the invention is conceived fully mechanically and in a way that does not alter the accordion's outer appearance and does not impact its standard external dimensions. The diatonic button accordion of the invention allows the musician to play in a variety of major keys, even up to five, without a need to take another accordion. Switching between various tunings is simple, quick and can be performed even during the performance without any interruption of playing.

[0019] The invention will be described in more detail by way of an embodiment and drawings representing in

Fig. 1 Diatonic button accordion
Fig. 2 Schematic illustration of a treble side with buttons, a three-part mechanism of levers, and a bottom
Fig. 3 Bottom in exploded view
Fig. 4 Reed block
Fig. 5 Reed block with reed plates
Fig. 6 Reed plate
Fig. 7 Bottom and reed block assembly

[0020] An accordion 100, particularly a diatonic button accordion, comprises a treble casing 1, a bass casing 2, and a bellows 3 arranged therebetween. A treble casing is normally on the right side of the bellows and thus on the right side of the accordion. A treble casing or a treble side serves to play a melody, while the bass side is used to add rhythmic accompaniment for the melody on the bass side. The principle of playing and producing tones is identical on both sides, the only difference between the sides being in the number of buttons 4 for individual tones. The treble side comprises at least three rows of buttons 4. An individual row of buttons represents a diatonic scale. Each button 4 is connected to each pallet 5 via a three-part mechanism 9 of levers, said pallet closing a multiple opening 731 in a bottom 7. The bottom 7 is conceived as a multi-layer panel assembly, to which the reed blocks 8 with reed plates 6 are fastened. The three-part mechanism 9 of levers can be conceived as known mechanisms of this type or in any other way and is not the object of the present invention.

[0021] The bottom 7 is conceived as a multi-layer panel assembly provided with openings, through which operating air is led to selected reed plates 6. All reed blocks 8 share a common bottom 7 that includes

- a bottom panel 71 provided with openings 711, wherein the openings 711 are arranged in five mutually parallel arrays, each array comprising 40 rectangularly shaped openings 711, there is a total of 5 x 40 openings,
- a middle panel 72 with openings 721 that match the openings 711 of the bottom panel 71,
- an upper panel 73 provided with a plurality of rectangular openings 731 arranged parallel to each other in one array and perpendicularly to the longitudinal extension of the upper panel 73, wherein the size of each opening 731 corresponds to the sizes of the openings 721, 711 arranged in the same row of all five arrays I, II, III, IV, V,
- a panel 74 arranged between the bottom panel 71 and the middle panel 72 and formed of five parallel perforated metallic bands 741 arranged next to each other, wherein the perforations 742 are arranged in a way to match the intermediate compartments between the openings 711, 721 of the bottom 71 and middle panel 72.

[0022] Each perforated metallic band 741 is connected to a tuning mechanism 10 of levers, said mechanism be-

ing connected with each tuning button 11 arranged on the treble side. Its functioning will be explained hereinbelow.

[0023] All said layers of the bottom 7 are superimposed as a pile and fastened to each other in a detachable manner, for instance by screws, or in a non-detachable manner, for instance by gluing, and form an entity referred to as the bottom 7. A pallet 5, the shape of which matches that of an opening 731, abuts on each opening 731 of the upper panel 73. Each pallet 5 is connected with an adequate button 4 on the treble side via three-part mechanism 9 of levers of any known type (not object of the invention).

[0024] The reed blocks 8 containing reed plates 6 are fastened on the lower side of the bottom 7, i. e. on the bottom panel 71. Each reed block 8 has substantially a flat rectangular shape that abuts with one longer lateral side to the bottom panel 71 of the bottom 7 in a way to extend perpendicularly to the bottom 7. Each reed block 8 comprises

- a fastening portion 81 in the area of one longer lateral side, with which it abuts on the bottom panel 71 of the bottom 7, wherein the fastening portion 81 contains openings 83 that continue into the flat carrier portion 81 of the reed block 8, said openings 83 matching in their size and arrangement the openings 711 of the bottom panel 71, and
- a flat carrier portion 82, on which the reed plates 6 are fastened, usually by a wax mixture.

[0025] The width of a reed block 8 corresponds to the width of the bottom 7, such that five openings 83 are arranged over the width in the fastening portion 81, said openings corresponding in size and arrangement to the openings 711, i. e. the openings within one row of all five arrays of the bottom panel 71. The height of the fastening portion 81 of a reed block 8 is sufficient to receive two mutually parallel rows of openings 83 with an arrangement corresponding to the arrangement of the openings 711 of the bottom panel 71. Each opening 83 of one row continues into each first chamber 823 in a first face 821 of the carrier portion 82 and each opening 83 of a second row continues into each second chamber 824 in a second face 821 of the carrier portion 82. The first chambers 823 and the second chambers 824 differ from each other in size, wherein the chambers of one size are located on the same face. Each chamber 823, 824 is closed by each reed plate 6, such that larger chambers are closed by longer reed plates 6 having longer reeds 61 and producing higher tones, while smaller chambers are closed by shorter reed plates 6 having shorter reeds 61 and producing lower tones. The carrier portion 82 of a reed block is optionally provided with grooves 86 on the face having shorter reed plates, said grooves enabling vibration of the opposite long reed 61.

[0026] Each reed block 8 is arranged on the bottom panel 71 of the bottom 7 in a way that the openings 83 of a reed block match two rows of openings 711. The bottom 7 thus has twenty reed blocks 8 which are arranged parallel to each other. Due to a limited space within the treble casing, the reed blocks 8 are arranged in a way that a face with long reed plates 6 and long reeds 61 is adjacent to the face with short reed plates 6 and short reeds 61. Since the plate with short reed plates 6 is provided with grooves (86), the long reeds 61 of the reed plates 6 can vibrate without hitting any obstacle.

[0027] In the embodiment, there are forty openings 711, 721 in the bottom 7 and forty openings 83 in the reed blocks 8, which are arranged within the same array I, II, III, IV, V, said number corresponding to the number of buttons 4 arranged in three rows on the treble side; this is true of a three-row accordion. Three rows of buttons 4 represent three major key tunes, this indicates forty different tones. This is why there is an identical number of reed plates 6 in one array I, II, III, IV, V, i. e. forty, wherein these reed plates 6 are arranged in all twenty reed blocks. Tuning the reed plates 6 arranged in one array I, II, III, IV, V yet in different reed blocks 8 is done in a way that these reed plates form three major keys and represent a major key combination of accordion tuning, for instance CFB, FisHE, FBEs, HEA, GCF and others. As the reed plates 6 are arranged in five mutually independent arrays I, II, III, IV, V, their tuning is done in five different major key combinations, wherein each represents a certain major key combination of accordion tuning.

[0028] Like with every accordion, each tone has multiple tuning in a diatonic button accordion as well. In the diatonic button accordion of the invention, each tone has three-voice tuning. Each reed plate 6 belonging to a certain opening 83 and thus to a certain tone has three reeds 61 and three valves 62 of felt, leather or any other suitable material on each side of a reed plate 6, which results in each reed plate 6 having six reeds 61 and six valves 62.

[0029] The bass side differs from the treble side particularly in the number of buttons. The fundamental concepts of the bottom 7 and the reed block 8 remain identical; they are adapted to the number of buttons on the bass side.

[0030] The reed blocks 8 and the bottom 7 form an assembly 13 which, together with a tuning mechanism 10 of levers and a tuning button 11, allows changing and selecting the tuning of the diatonic button accordion, wherein the tuning is changed merely mechanically.

[0031] Said assembly 13 provides for tuning of one diatonic button accordion in several various keys, i. e. in up to five various major key combinations. The number of combinations depends on the number of rows of buttons 4. In the event of more modest requirement, certain arrays of openings 711, 721 in the bottom and consequently the adjacent openings 82 in the reed blocks are filled/closed. Of course, more than five major key combinations are feasible, yet this results in a larger dimension and mass of the diatonic button accordion. Changes of this type are disliked by the users as the outer appear-

ance of the instrument must remain is intact as possible.

[0032] Of course, the bottom 7 and the corresponding reed blocks 8 can be conceived in different dimensions with more or less arrays and with more or less rows of openings. In case of fewer arrays and/or less rows of openings, the entire available space within a casing is not fully used. In case of a larger number of arrays and/or rows of openings, the dimensions of a diatonic button accordion change; this consequently changes the outer appearance of the accordion.

[0033] Individual components can be from various materials such as light-weight metallic materials, plastic materials. It is important for the applied material to have mechanical properties required for a certain component and to have as low specific mass of the material as possible, wherewith the diatonic button accordion of the invention maintains an identical mass as a conventional accordion.

[0034] The accordionist selects a certain major key combination by pushing one of the tuning buttons 11 arranged both on the treble side and the bass side. The tuning buttons 11 are arranged proximal to the playing buttons 4 and a musician can simply and rapidly reach them while playing. When a tuning button 11 is pushed, the tuning mechanism 10 of levers which connects each tuning button 11 with a suitable perforated metallic band 741 is activated. The latter moves in longitudinal direction in parallel with the adjacent perforated metallic band and in parallel with each panel, such that perforations 742 of the metallic band fit the openings 711 of the bottom panel 71 and the openings 721 of the middle panel 72 of the same array, which corresponds to the selected major key combination. The perforated metallic bands 741 of other arrays remain still and are arranged between the bottom 71 and the upper panel 72, closing the openings 711 and 721 of both panels. The air can thus only pass through the openings of the selected array which corresponds to the selection performed by the tuning button. When a treble button 4 is pushed, the pallet 5 moves away from the assembled bottom 7. The air is forced through the opening 731 of the upper panel 73 and further to the opening 721 of the middle panel 72, both panels being arranged in the array which has been opened by the tuning button. The air can travel only through the opening(s) of the array, the perforated metallic band 741 of which has moved in translation and has opened a path to the air through the openings 711, and further through the openings 83 of the reed block 8 all the way to a reed plate 6 and its reeds 61. When a musician desires to switch tuning, he pushes the tuning button 11 again thus triggering the tuning mechanism 11 of levers in the opposite direction; the perforated metallic band 741 shifts in the previous position and the openings 711, 721 of the entire array close. Then another tuning button 11 is pushed and the procedure of selecting tuning repeats.

Claims

1. An accordion, particularly a diatonic button accordion, comprising a treble casing, a bass casing, and a bellows arranged therebetween, wherein buttons for playing the accordion are arranged on both the treble casing and the bass casing, said buttons being connected with a respective pallet via a mechanism of levers, said pallet closing an opening in the bottom of a reed block comprising reed plates, **characterized by**
including an assembly (13) that comprises

- a bottom (7) formed of superimposed panels with openings, and
- reed blocks (8) arranged on the bottom (7) and arranged parallel to each other,

wherein the common bottom (7) is shared by all reed blocks (8).

2. Accordion according to claim 1, **characterized in that** the bottom (7) includes

- a bottom panel (71) provided with openings (711), wherein the openings (711) are arranged in five mutually parallel arrays (I, II, III, IV, V), each array comprising forty openings (711),
- a middle panel (72) with openings (721) that match the openings (711) of the bottom panel (71),
- an upper panel (73) with rectangularly shaped openings (731) arranged parallel to each other in one array (I, II, III, IV, V) and perpendicularly to the longitudinal extension of the upper panel (73), wherein the size of each opening (731) corresponds to the sizes of the openings (721, 711) arranged in the same row of all five arrays (I, II, III, IV, V),
- a panel (74) arranged between the bottom panel (71) and the middle panel (72) and formed of five parallel perforated metallic bands (741) arranged next to each other, wherein the perforations (742) are arranged in a way to match the intermediate compartments between the openings (711, 721).

3. Accordion according to any preceding claim, **characterized in that** the reed block (8) has substantially a flat rectangular shape, the width of which corresponds to the width of the bottom (7), and comprises

- a fastening portion (81) with openings (83) that match the openings (711) of the bottom panel (71) of the bottom (7), and
- a flat carrier portion (82), on which the reed plates (6) are fastened.

4. Accordion according to claim 3, **characterized in that** the fastening portion (81) contains two mutually parallel arrays of five openings (83) that match the openings (711) of the bottom panel.

5. Accordion according to claim 3, **characterized in that** a reed block (8) has chambers (823, 824) arranged in the carrier portion, which are closed by reed plates (6).

6. Accordion according to claim 5, **characterized in that** the chambers (823, 824) on one face (821, 822) of the carrier portion (82) of a reed block (8) are larger than the chambers (823, 824) on the other face (821, 822) of the carrier portion (82) of a reed block (8).

7. Accordion according to claim 3, **characterized in that** a reed plate (6) has three reeds (61) and three valves (62), what provides for triple tuning.

8. Accordion according to claim 7, **characterized in that** the reed plates (6) located within the same array (I, II, III, IV, V) are tuned in three major keys.

9. Accordion according to any preceding claim, **characterized in that** the reed plates (6) located in various arrays (I, II, III, IV, V) are tuned in various major key combinations.

10. Accordion according to any preceding claim, **characterized in that,** in its form, the pallet (5) matches the opening (731) and abuts on it.

11. Accordion according to any preceding claim, **characterized in that** each perforated metallic band (741) is connected via tuning mechanism (10) of levers with a tuning button (11) arranged on the casing.

12. Accordion according to any preceding claim, **characterized in that** the assembly (13) comprises twenty reed blocks (8).

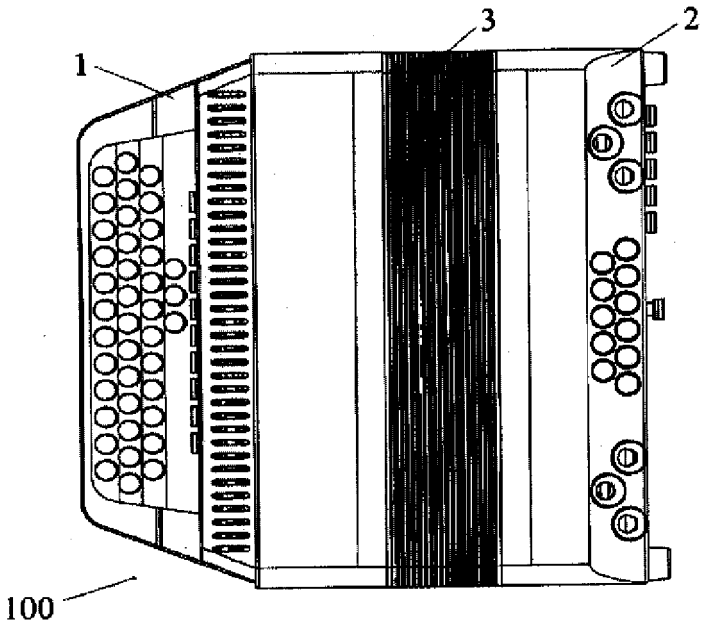

Fig. 1

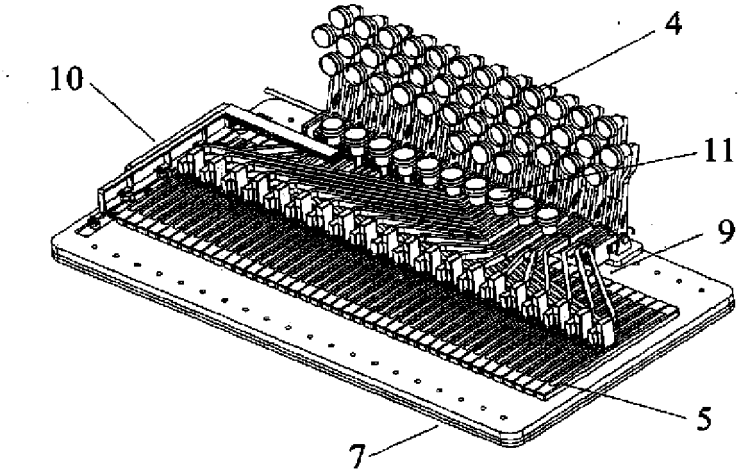

Fig. 2

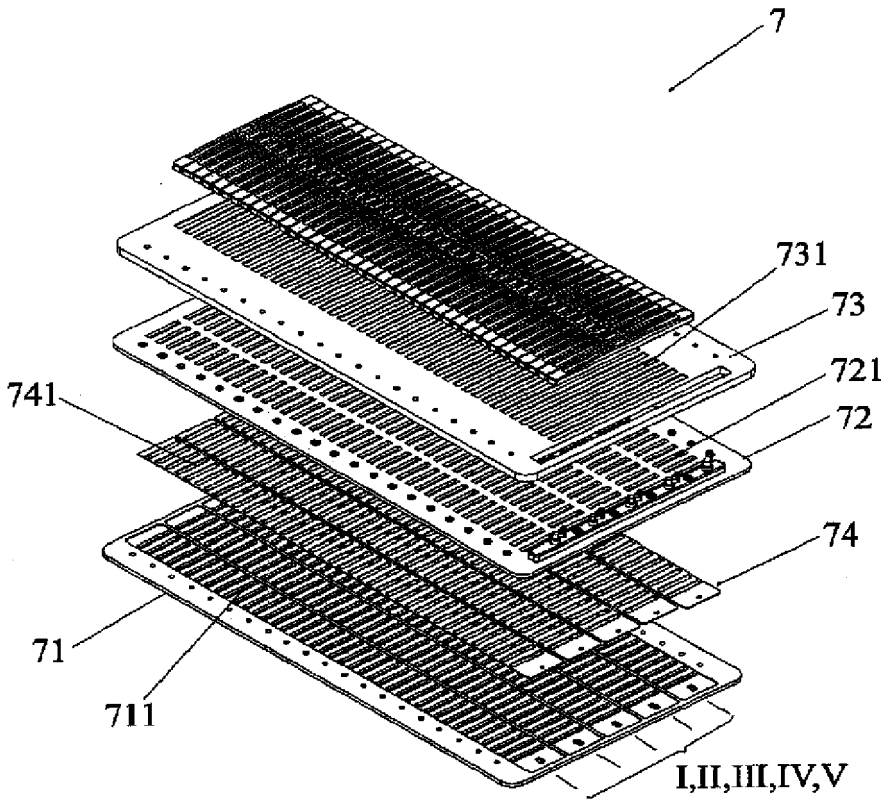

Fig. 3

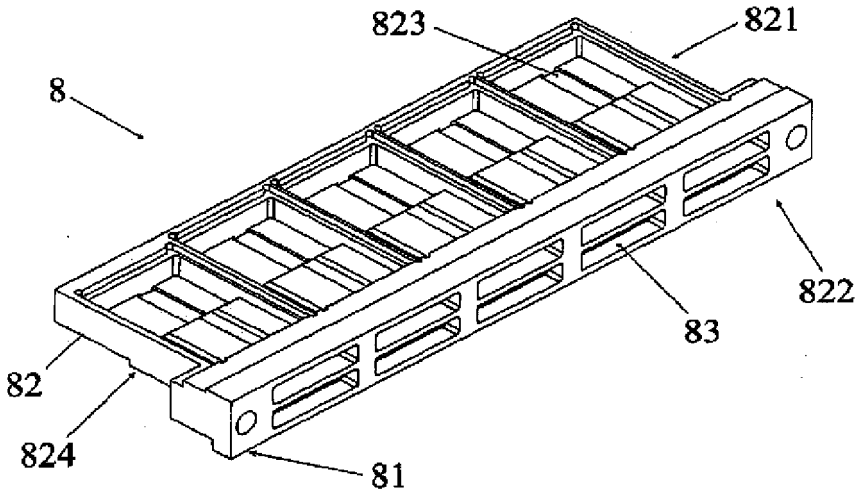

Fig. 4

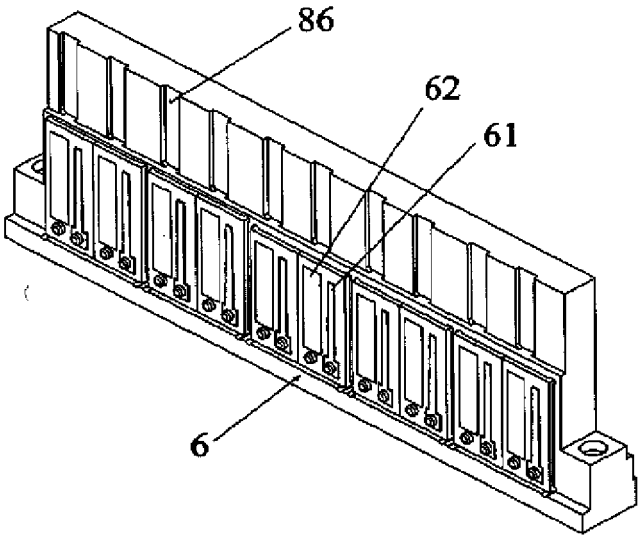

Fig. 5

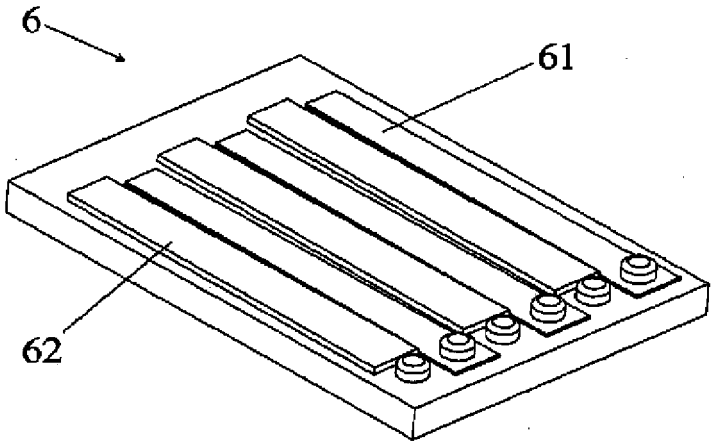

Fig. 6

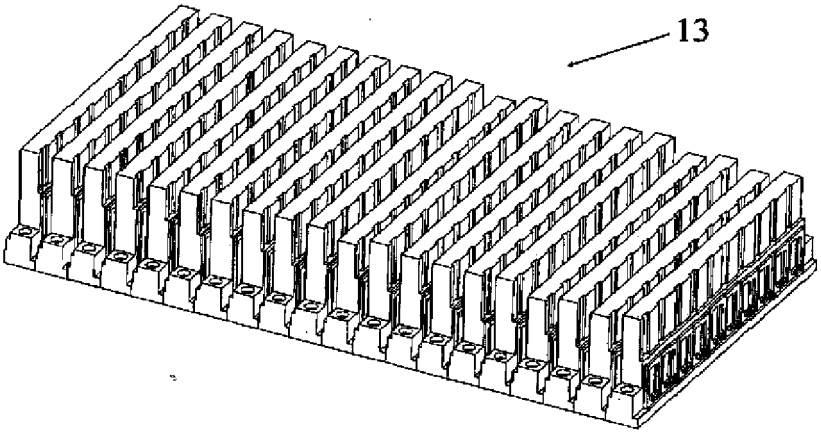

Fig. 7

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EUROPEAN SEARCH REPORT

Application Number
EP 18 00 0403

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	2 October 2018	Breccia, Luca

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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