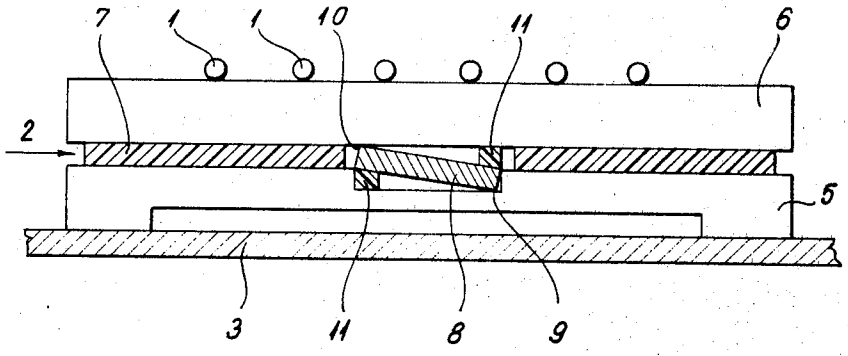
April 21, 1970 I. SEBOK 3,507,972

MICROPHONE BRIDGE FOR STRING INSTRUMENTS

Filed May 19, 1967



INVENTOR

ISTVAN SEBOK

BY Young & Thompson

ATTORNEYS

United States Patent Office 3,507,972 Patented Apr. 21, 1970

3,507,972

MICROPHONE BRIDGE FOR STRING INSTRUMENTS

Istvan Sebok, Szeged, Hungary, assignor to Szegedi Hangszergyar, Szeged, Hungary

Filed May 19, 1967, Ser. No. 639,724
Claims priority, application Hungary, July 14, 1966, SE 1,323
Int. Cl. G10h 3/00; G10d 5/00
U.S. Cl. 84—1.14 3 Claims

ABSTRACT OF THE DISCLOSURE

The present invention relates to a microphone bridge for string instruments made of two parts, one part engaging the strings and the other the resonator. A piezo-electric crystal is situated between the said two parts for transforming the vibration of the strings into sound frequency.

The present invention relates to the amplification of the sound of string instruments. This was achieved so far mainly by means of electromagnetic pick-ups in such a way that the string vibrating in the field of a permanent magnet induces in the coil surrounding the magnet an alternating current corresponding to the sound frequency, this current being then amplified and fed to a loud-speaker. The most important condition for employing said pick-ups was that the material of the strings be magnetizable, i.e. that they be made e.g. of iron or steel.

For the transformation of the sound or plastic or gut-strings into an electric signal there are solutions known in which by means of an auxiliary clamping arrangement of various designs a piezo-electric crystal is fastened to a selected point on the musical instrument, said crystal taking over the vibration existing at the given point. These devices have many drawbacks: first the clamping systems do not force the crystal to take over from the musical instrument the entire vibration, second the self-vibration of the crystal and of the clamping arrangement may modify the signal taken off from the musical instrument, and third the selected points on the musical instrument do not comprise the whole characteristic range of sound of the musical instrument.

The invention eliminates these drawbacks because the crystal producing the sound frequency is forced—owing to its arrangement—to become deformed only according to the movement achieved by the strings on the resonator, therefore the crystal takes over invariably the vibration arising from the string, and so a very good amplification or modification is obtained. For this purpose a microphone bridge according to the invention takes over the vibration of the strings for the excitation of sound frequency in the same way as it is taken over by the resonator of the musical instruments from the traditional bridge. As a result thereof, the characteristics of the sound obtained are the same or almost the same as those of the accepted traditional sound of the musical instruments.

The invention relates thus to a microphone bridge for string instruments, characterized in that the bridge transmitting mechanically the vibration of the strings is divided in two, or consists of two parts, and between these parts there is a flat elastic distance piece parallel to the plane of the strings or of the resonator enabling the relative displacement and vibration of said parts, and a piezo-electric crystal is also between the two parts so that it is deformed in consequence of the relative displacement of the two parts of the bridge, thus electrical signals are produced which may be amplified and transformed into sound in a manner well known per se.

The invention is described in detail with reference to the enclosed drawing which represents an embodiment by way of example. The figure shows the schematic cross-section of the microphone bridge.

The strings **1** bear against a bridge **2** which supports the strings at an appropriate location and transmits their vibration to the resonator **3** of the musical instrument by way of direct contact. Parallel with the plane of strings **1** and/or of resonator **3** the bridge **2** is cut in two, the lower part **5** and the upper part **6** of the bridge being at a distance from one another which allows placing therebetween an elastic distance piece **7** enabling the independent elastic movement of the upper part **6**, and a piezo-electric crystal **8** transforming the vibrations of strings **1** into sound frequency is also between parts **5** and **6**.

Between the lower part **5** and the upper part **6** of bridge **2** the piezo-electric crystal **8** of prismatic shape is placed obliquely in such a way that its one end bears against a cavity **9** of the lower part, and the other end engages a surface **10** of the upper part. Thus the crystal touches the parts **5** and **6** along two diagonally opposite edges, the engagement being ensured by elastic pads **11**.

The mass of the two parts **5**, **6** of the bridge is almost equal to that of the usual undivided bridge.

The upper part **6** of bridge **2** transmits the vibration of strings **1** by moving together with the strings, and deforms in the rhythm of the vibration the piezo-electric crystal **8** touching the same. As a result thereof the crystal **8** produces an alternating current the frequency of which corresponds to the vibration of the strings. This can be amplified in a manner known per se as required, in an electric amplifier and the amplified current can be used in an electric loud-speaker.

The device according to the invention allows of transforming any vibration of strings into a perfect sound frequency.

I claim:

1. A microphone bridge for string instruments having a resonator, the bridge supporting the strings and transmitting mechanically their vibration to the resonator, the bridge comprising an upper and a lower part the upper part engaging the said strings and the lower the resonator, an elastic distance piece between said parts disposed parallel to the plane of the strings and permitting a displacement of the upper part relative to the lower one, and at least one piezo-electric crystal engaging the two bridge parts to produce electrical signals upon relative movement of said parts.

2. A microphone bridge according to claim **1**, wherein said crystal has a prismatic shape with diagonally opposite edges bearing one against each of said bridge parts, the crystal being disposed between said bridge parts obliquely with respect to the plane of said elastic distance piece.

3. A microphone bridge according to claim **2**, and resilient means by which said crystal is supported in said oblique position.

References Cited

UNITED STATES PATENTS

2,334,744	11/1943	Benioff	84—1.16
2,494,485	1/1950	Notara	84—1.16
3,076,903	2/1963	Schwartz	310—8.3
3,113,990	12/1963	Zanessi	84—1.16
3,394,275	7/1968	Lippmann	310—8.3

HERMAN KARL SAALBACH, Primary Examiner
T. VEZEAU, Assistant Examiner

U.S. Cl. X.R.
84—1.16