

March 4, 1952

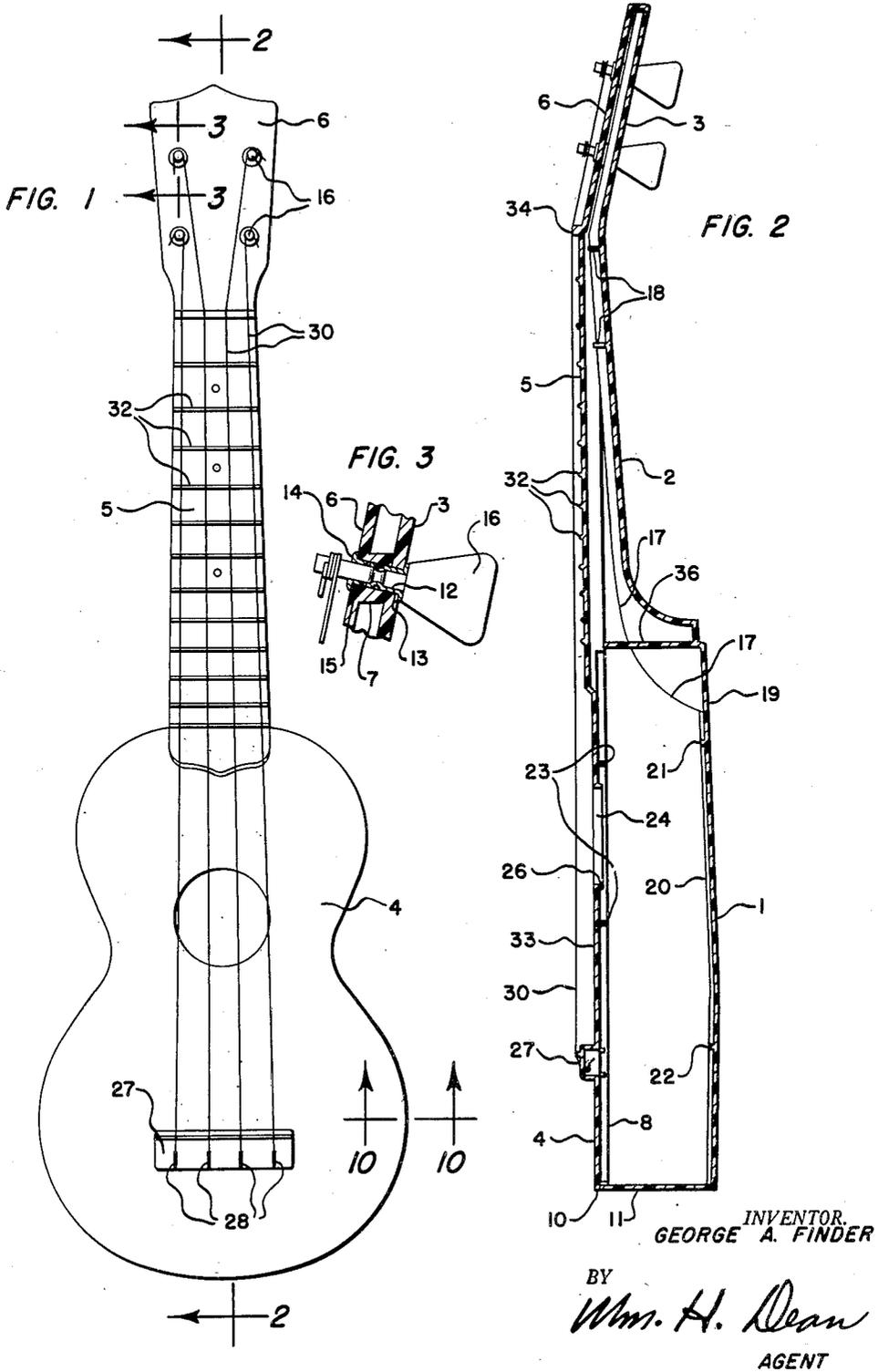
G. A. FINDER

2,588,101

MUSICAL INSTRUMENT CONSTRUCTION

Filed July 15, 1950

2 SHEETS—SHEET 1



March 4, 1952

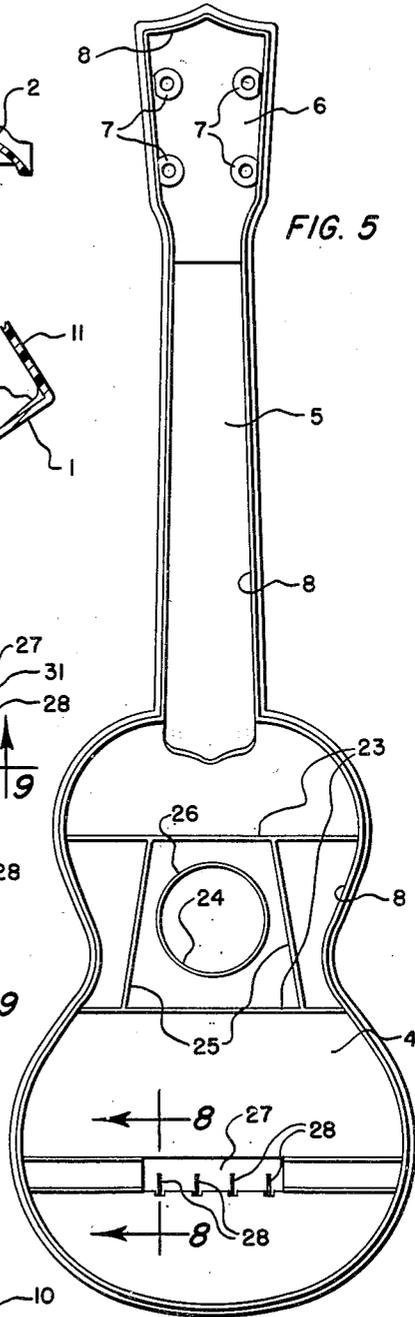
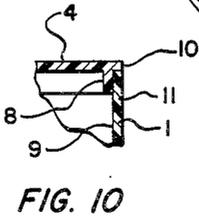
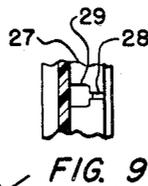
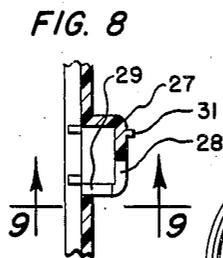
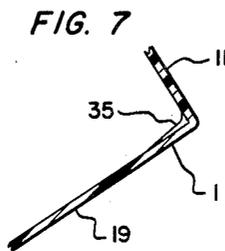
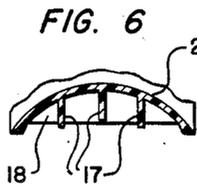
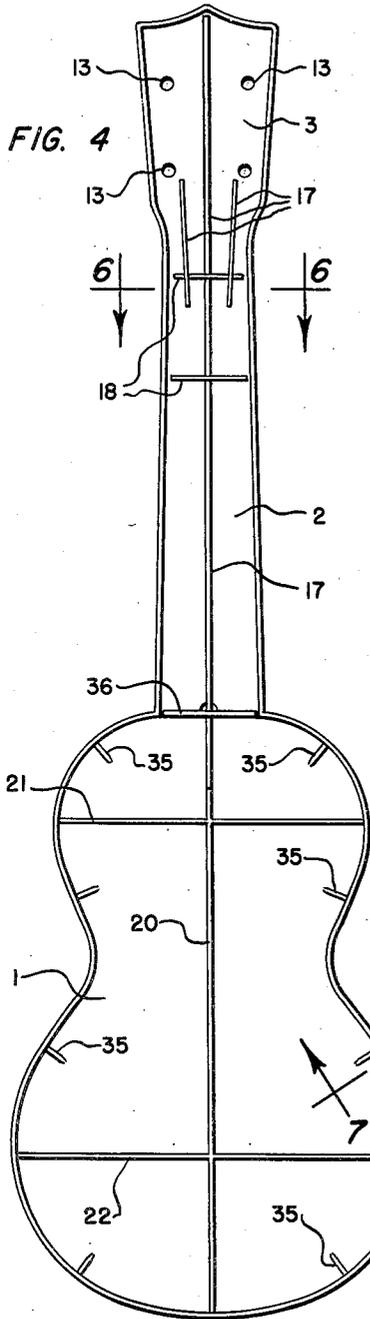
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MUSICAL INSTRUMENT CONSTRUCTION

Filed July 15, 1950

2 SHEETS—SHEET 2



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# UNITED STATES PATENT OFFICE

2,588,101

## MUSICAL INSTRUMENT CONSTRUCTION

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Application July 15, 1950, Serial No. 174,095

12 Claims. (Cl. 84—291)

REISSUED

FEB 24 1953

2 RE 23620

1 My invention relates to a musical instrument construction, more particularly to the construction of stringed musical instruments, and the objects of my invention are:

First, to provide a musical instrument construction which promotes injection molding of various musical instruments of plastic material;

Second, to provide a musical instrument construction in which a complete stringed musical instrument may be formed of two castings by addition of strings and keys;

Third, to provide a musical instrument construction of this class having very fine acoustical arrangement when constructed of two plastic castings;

Fourth, to provide a musical instrument construction of this class which provides an instrument which is very durable, impervious to water and numerous solvents, and which will withstand very great temperature variations;

Fifth, to provide a musical instrument construction of this class having novel top and integral bridge construction for holding the strings of the musical instrument;

Sixth, to provide a musical instrument construction of this class having a novel key-holding structure in the head thereof;

Seventh, to provide a musical instrument construction of this class having novel reinforcing structure cast therein which permits the instrument to be very light in weight in proportion to its strength;

Eighth, to provide a musical instrument construction of this class in which the neck is integral with the body and the finger board is integral with the top, providing a structure which is very easy to assemble, promoting economy of manufacture;

Ninth, to provide a musical instrument construction of this class in which the musical instrument is substantially completed by the assembly of two castings, having novel indexing flanges which provide accurate interengagement of the two castings, which greatly facilitates the assembly thereof; and

Tenth, to provide a musical instrument construction of this class which is very simple and economical, efficient, durable, and which will not readily deteriorate or get out of order.

With these and other objects in view, as will appear hereinafter, my invention consists of certain novel features of construction, combination and arrangement of parts and portions, as will be hereinafter described in detail and particularly set forth in the appended claims, reference be-

ing had to the accompanying drawings and to the characters of reference thereon, forming a part of this application, in which:

Fig. 1 is a top or plan view of a musical instrument, more particularly a ukulele, incorporating my musical instrument construction; Fig. 2 is a longitudinal sectional view thereof, taken from the line 2—2 of Fig. 1; Fig. 3 is an enlarged fragmentary sectional view, taken from the line 3—3 of Fig. 1; Fig. 4 is a top or plan view of the lower body casting of my musical instrument construction; Fig. 5 is a bottom plan view of the upper top and finger board casting of my musical instrument construction; Fig. 6 is an enlarged fragmentary sectional view, taken from the line 6—6 of Fig. 4; Fig. 7 is an enlarged fragmentary sectional view, taken from the line 7—7 of Fig. 4; Fig. 8 is an enlarged fragmentary sectional view, taken from the line 8—8 of Fig. 5; Fig. 9 is a fragmentary sectional view, taken from the line 9—9 of Fig. 8; and Fig. 10 is an enlarged fragmentary sectional view, taken from the line 10—10 of Fig. 1.

Similar characters of reference refer to similar parts and portions throughout the several views of the drawings.

In my musical instrument construction, I have provided two separate castings, which are preferably made by the injection molding process, and of plastic material. One of the castings, as shown in Fig. 4 of the drawings, incorporates the musical instrument body 1, having an integral arcuate in cross-section neck 2, which includes a key-supporting head portion 3. The other casting, shown in Fig. 5 of the drawings, incorporates a top 4, having an integral finger board portion 5, and cover portion 6, provided with projecting key-receiving bosses 7, which are integral therewith. Spaced from the outer outline edge portions of the top casting 4 are angular flange portions 8, shown in detail in Fig. 10 of the drawings, which engage the internal side wall portions 9 of the body 1, greatly facilitating the assembly of the castings 1 and 4, and strengthening the structural connection thereof.

It will be noted that the spacing of the angular flange 8 from the outer edge 10 of the top casting 4, as shown in Fig. 10 of the drawings, is equal to the thickness of the side wall 11 of the body casting 1, all as shown best in Fig. 10 of the drawings. It will be noted that the top casting 4 and body casting 1 are assembled by providing a coating of solvent cement adjacent the flange 8, so that after assembly the castings 1 and 4 become substantially integral. The assem-

bly of the castings 1 and 4 is therefore very simple, and requires only the placement of the cement on the outer side of the flange 8 preliminary to the fitting of the top casting 4 on to the body casting 1, shown in detail in Fig. 10 of the drawings. During the assembly of the top casting 4 with the body casting 1, solvent cement is placed on the ends of the bosses 7 which abut the head portion 3 of the body casting 1, shown best in Fig. 3 of the drawing. Thus, the bosses 7 are adhered to the head portion 3, as shown in Fig. 3 of the drawings, then the bushing 12 is pressed into the opening 13 in the head portion 3, and forced into the boss 7. A metal eyelet 14 is pressed into the opening 15 in the boss 7, and the key holding structure is complete.

Reference is made to my co-pending application for String Holding Key for Musical Instruments, Serial No. 155 031, filed April 10, 1950, now matured into U. S. Patent No. 2,583,478, dated January 22, 1952, which discloses the details of the keys 16 and bushings 13 in relationship to the head of a musical instrument.

The neck portion 2 of the body casting 1, as shown in Figs. 4 and 6 of the drawings, is arcuate in cross-section and is provided with a plurality of longitudinal stiffeners 17, which are integral with the neck portion 2 and with the chord-shaped transverse stiffeners 18, providing rigidity of the neck portion 2 of the body casting 1. It will be noted that the middle longitudinal stiffener 17 extends to the body portion of the body casting 1, and is integral with a transverse partition 36, which is disposed at the transition between the neck portion 2 and the body portion of the body casting 1. This middle reinforcing portion 17 extends beyond said partition 36, as shown in Fig. 2 of the drawings, and is integral with the bottom 19 of the body casting 1, shown best in Fig. 2 of the drawings. It will be noted that this reinforcing portion 17 provides rigidity of the neck 2 for supporting strings under tension on the musical instrument.

In the body casting 1, integral with the bottom 19 thereof, and extending the full length of the bottom 19, is a reinforcing rib 20, which is in alignment with the reinforcing rib 17 and transversely of this reinforcing rib 20 are the reinforcing ribs 21 and 22, all of which serves to stiffen the back 19 of the body member 1.

The top casting 4, as shown in Fig. 5 of the drawings, is provided with a plurality of reinforcing ribs 23, which extend laterally of the longitudinal axis of the top casting 4, at opposite sides of the sound hole 24, and interconnecting these ribs 23 are secondary reinforcing ribs 25 at opposite sides of the sound hole 24, at an acute angle to the longitudinal axis of the top casting 4. Surrounding the sound hole 24 is a reinforcing rib 26, which is annular, as shown best in Figs. 2 and 5 of the drawings. The top casting 4 is provided with an integral string-holding bridge 27, shown in Fig. 2 of the drawings in section, and in detail in Figs. 8 and 9. This string-holding bridge is substantially channel-shaped in cross-section and is integral with the top casting 4, and is provided with string-supporting slots 28, which extend through the normally upper portion thereof and through the rear side wall of said channel-shaped in cross-section bridge 27. These slots 28 are each provided with an enlarged portion 29, through which the knot ends of strings may be inserted during the stringing of the instrument. It will be noted that the channel-shaped in cross-section bridge

27 is open inwardly of the musical instrument, as shown in Fig. 2 of the drawings, providing room for the insertion of a knot on the strings 30, which engage the bar 31 of the bridge 27 in their extended relationship toward the keys 16, to which they are connected at their opposite ends.

The neck portion 5 of the top casting 4 is provided with accurately graduated finger-board frets 32, which are integral therewith and raised above the upper surface 33 of the top casting 4. At the extreme end of the finger-board of the neck portion 5 is an integral nut 34, over which the strings pass in angular relationship to the keys 16. As shown in Fig. 4 of the drawings, and in detail in Fig. 7, the body casting side wall portions are provided with reinforcing ribs 35, which are integral with the side walls 11 and the back 19, for stiffening the construction of the body casting 1 at the transition of said side walls 11 and back 19.

The operation of my musical instrument construction is substantially as follows:

When the top casting 4 has been cemented to the body casting 1, as hereinbefore described, and when the keys 16 are in place as shown in Figs. 1, 2 and 3 of the drawings, the strings 30 may be provided with knotted portions near their ends, which may be inserted through the enlarged openings 29 in the bridge 27, then the strings may be pulled over the bar 31 and the nut 34 to a position in connected relationship with the keys 16, whereupon they may be tightened to the proper pitch. When the stresses in the strings 30 reach the desired value to provide tone pitch, the various reinforcing ribs within the body casting 1 and top casting 4 resist deflection of the neck of the musical instrument relative to the body thereof.

The arcuate cross-section neck portion 2 of the body member 1 provides structural strength in its integral cemented relationship with the finger-board neck portion 5 of the top casting 4. The flange 8, as shown in Fig. 10, which extends completely around the outline of the instrument, provides additional stiffening therefor, and the integral construction provided by the solvent cement connecting the body casting 1 and top casting 4 renders the instrument very strong and of a unitary resonant character.

The playing of my musical instrument construction, as shown in Figs. 1 and 2 of the drawings, is conventional, and it will be here noted that the hollow neck of the instrument provided by the arcuate cross-section neck portion 2 of the body casting 1 promotes proper balance of the instrument during playing, and thereby provides a certain ease of handling of the instrument by the left hand during the fingering of the strings on the frets 32, shown best in Fig. 2 of the drawings.

Though I have shown and described a particular construction, combination and arrangement of parts and portions, I do not wish to be limited to this particular construction, combination and arrangement, but desire to include in the scope of my invention the construction, combination and arrangement substantially as set forth in the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a musical instrument construction, a body casting having an arcuate in cross-section neck integral therewith and a top casting provided

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with an integral finger-board thereon, having a flange engageable with the inner side wall of said body casting cemented to said inner side wall, said neck portion and said finger-board portion having head portions integral therewith abutting each other, said finger-board portion, at its head portion, provided with lugs abutting the head portion of said neck portion of said body casting and adhered thereto.

2. In a musical instrument construction, a body casting having an arcuate in cross-section neck integral therewith, and a top casting provided with an integral finger-board thereon, having a flange engageable with the inner side wall of said body casting cemented to said inner side wall, said top casting provided with an integral channel-shaped in cross-section bridge portion, having a plurality of slots therein, having enlarged opening portions at the rear of said channel-shaped in cross-section bridge portion, said neck portion of said body casting having longitudinal stiffeners therein, one of said stiffeners extending into and integral with the body portion of said body casting.

3. In a musical instrument construction, a plastic body casting having an arcuate in cross-section neck portion, a body back portion and integral side wall portions, a top casting having an angular flange spaced from the outer edges thereof, engageable with the inner side wall of said body casting and adhered to said inner side wall, said top casting having a finger-board portion integral therewith adhered to said arcuate in cross-section neck portion of said body casting, said finger-board and said neck portion provided with head portions adapted to receive keys.

4. In a musical instrument construction, a plastic body casting having an arcuate in cross-section neck portion, a body back portion and integral side wall portions, a top casting having an angular flange spaced from the outer edges thereof, engageable with the inner side wall of said body casting and adhered to said inner side wall, said top casting having a finger-board portion integral therewith adhered to said arcuate in cross-section neck portion of said body casting, said finger-board and said neck portion provided with head portions adapted to receive keys, boss portions integral with one of said head portions and adhered to the other of said head portions.

5. In a musical instrument construction, a plastic body casting having an arcuate in cross-section neck portion, a body back portion and integral side wall portions, a top casting having an angular flange spaced from the outer edges thereof, engageable with the inner side wall of said body casting and adhered to said inner side wall, said top casting having a finger-board portion integral therewith adhered to said arcuate in cross-section neck portion of said body casting, said finger-board and said neck portion provided with head portions adapted to receive keys, boss portions integral with one of said head portions and adhered to the other of said head portions, longitudinal and transverse reinforcing ribs integral with the back portion of said body casting, said top casting provided with a sound hole therein, having reinforcing ribs therearound.

6. In a musical instrument construction, a plastic body casting having an arcuate in cross-section neck portion, a body back portion and integral side wall portions, a top casting having an angular flange spaced from the outer edges thereof, engageable with the inner side wall of said body casting and adhered to said inner side

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wall, said top casting having a finger-board portion integral therewith adhered to said arcuate in cross-section neck portion of said body casting, said finger-board and said neck portion provided with head portions adapted to receive keys, boss portions integral with one of said head portions and adhered to the other of said head portions, longitudinal and transverse reinforcing ribs integral with the back portion of said body casting, said top casting provided with a sound hole therein, having reinforcing ribs therearound, said top casting provided with transverse reinforcing ribs adjacent said sound hole.

7. In a musical instrument construction, a cast instrument top having an integral normally inverted channel-shaped in cross-section bridge thereon, provided with string-receiving slots in one normally vertical side wall thereof communicating with the inner side of said top, said slots having enlarged open portions near instrument top for receiving string knots.

8. In a musical instrument construction, a cast instrument top having an integral normally inverted channel-shaped in cross-section bridge thereon, provided with string-receiving slots in one normally vertical side wall thereof communicating with the inner side of said top, said slots having enlarged open portions near instrument top for receiving string knots, said channel-shaped in cross-section bridge having a bar at the normally upper side thereof integral therewith, spaced from said slots, over which said strings may be engaged.

9. In a musical instrument construction, a musical instrument neck head, comprising a pair of spaced head portions adhered to each other, one of said head portions having integral hollow bosses abutted and adhered to the other of said head portions, metal bushings extending through said hollow bosses, and keys revolvably mounted in said bushings.

10. In a musical instrument construction, a body casting having an arcuate in cross-section neck integral therewith and a top casting provided with a finger-board thereon, having a flange engageable with the inner side wall of said body casting cemented to said inner side wall, said body casting having a back portion and side wall portions and reinforcing ribs at the transition of said back portion and said side wall portions for reinforcing the same.

11. In a musical instrument construction, a body casting having an arcuate in cross-section neck integral therewith and a top casting provided with a finger-board thereon, having a flange engageable with the inner side wall of said body casting cemented to said inner side wall, said body casting having a back portion and side wall portions and reinforcing ribs at the transition of said back portion and said side wall portions for reinforcing the same, said ribs integral with said back portion and said side wall portions.

12. In a musical instrument construction, a body casting having an integral neck portion, and a top casting provided with an integral finger-board fixed to said body casting, said neck portion and said fingerboard portion provided with head portions contiguously fixed to each other, one of said head portions provided with integral boss portions adhered to the other of said head portions, said boss portions having openings extending therethrough, and keys in said openings.

GEORGE A. FINDER.

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