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Starns

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[54] **CHORD SELECTOR APPARATUS FOR STRINGED MUSICAL INSTRUMENTS**

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[52] **U.S. Cl.** **84/317**
[51] **Int. Cl.** **G10d 3/00**
[58] **Field of Search** 84/315–317

[56] **References Cited**

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[57] **ABSTRACT**

A chord selector for a stringed musical instrument comprising: a support carriage adapted for attachment to a musical instrument; a plurality of string depressors mounted on the support carriage movable between positions not engaging the strings of the musical instrument and positions engaging the strings; a plurality of selector keys mounted on the support carriage; and an operating assembly connecting the selector keys and the string depressors and responsive to movement of any one of the selector keys to move selected ones of the stringed depressors from non-engaging positions to positions engaging the strings whereby a preselected musical chord may be produced on said instrument.

1 Claim, 4 Drawing Figures

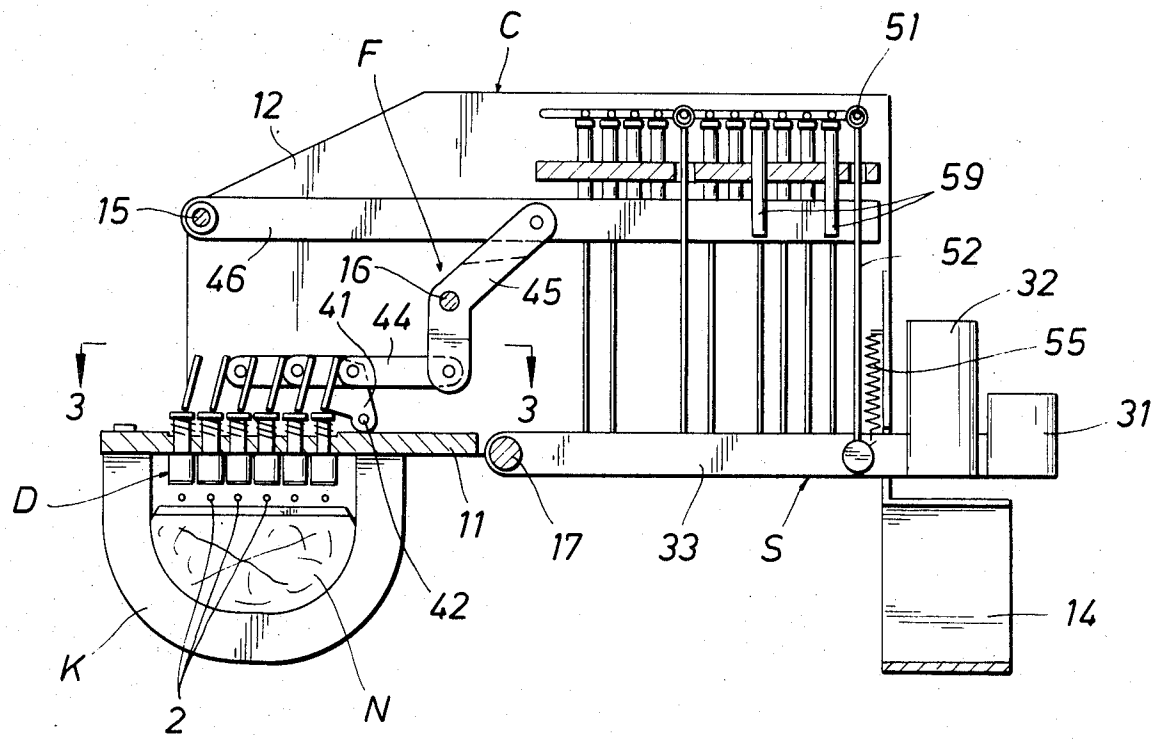


FIG. 1

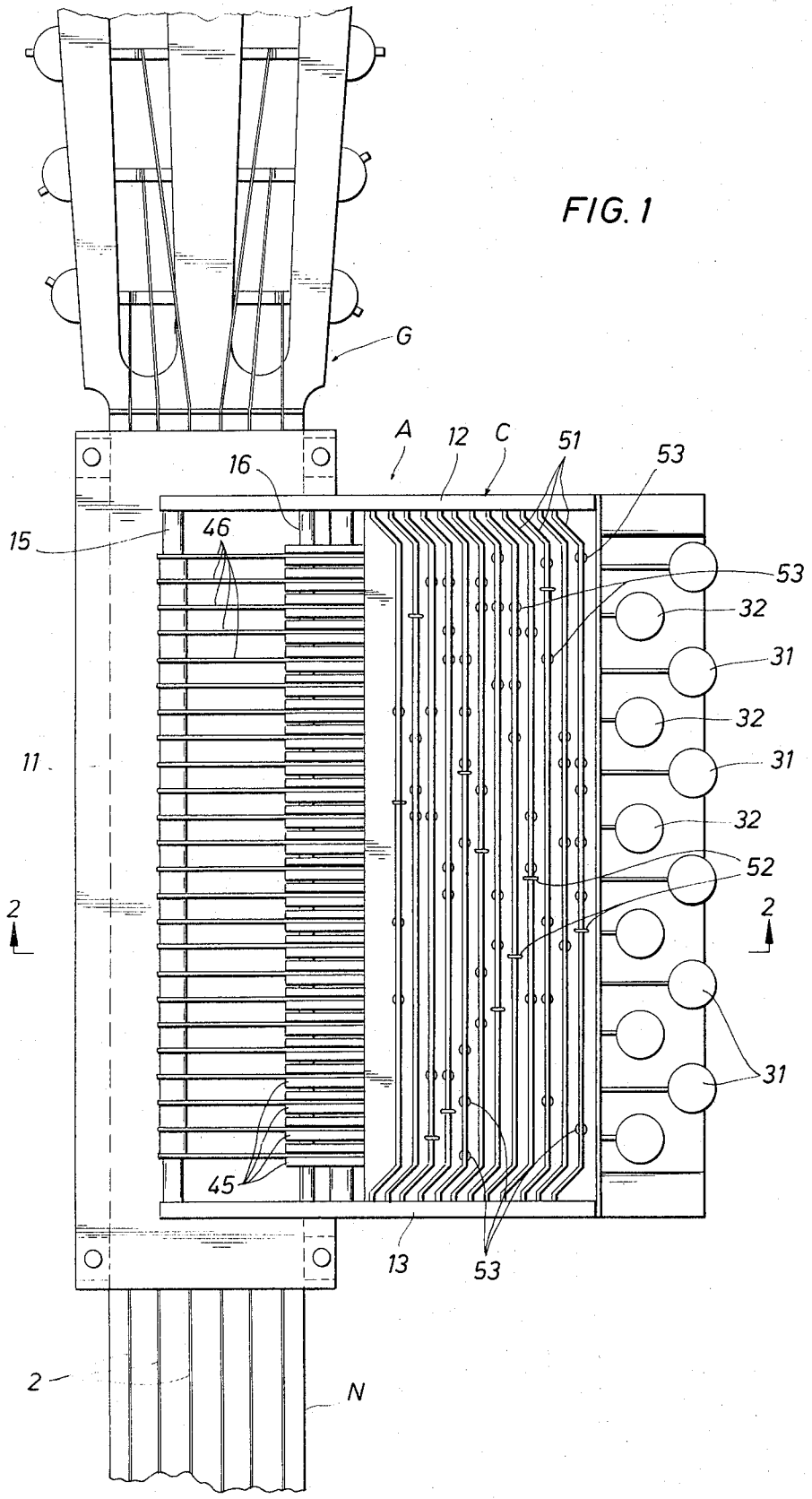


FIG. 2

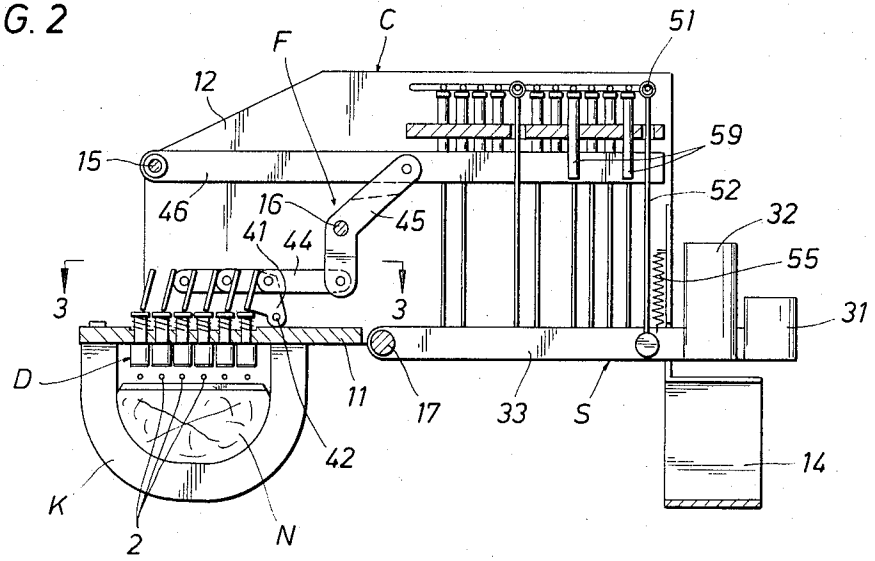
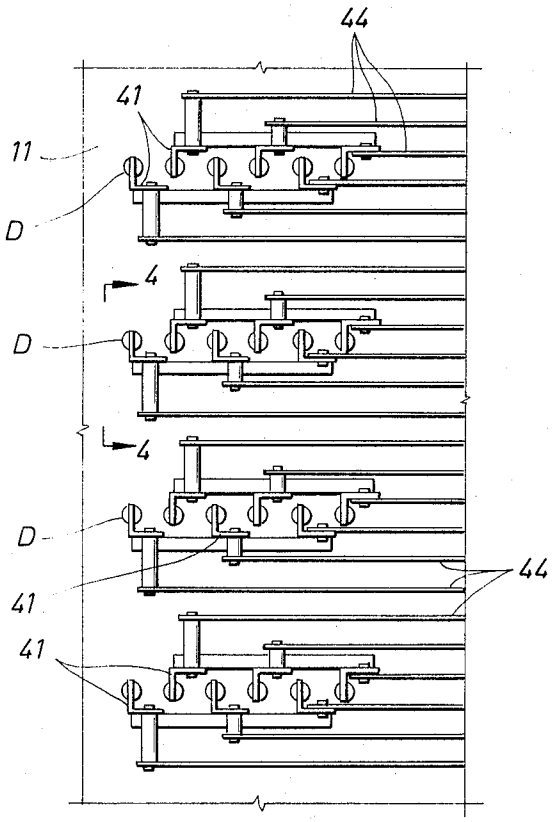


FIG. 3



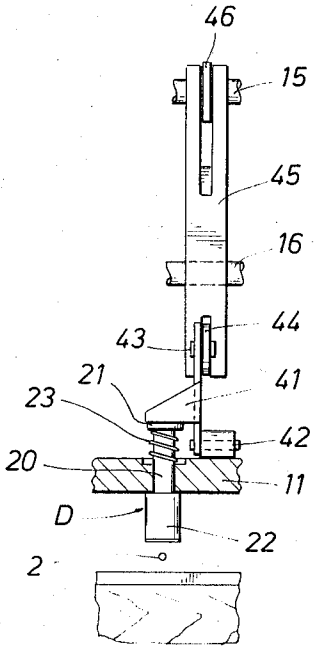


FIG. 4

CHORD SELECTOR APPARATUS FOR STRINGED MUSICAL INSTRUMENTS

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention pertains broadly to musical instruments and in particular to stringed musical instruments such as guitars, ukuleles and the like. More specifically the present invention pertains to apparatus for selectively producing musical chords on such an instrument by means other than the conventional finger depression of the strings.

2. Brief Description of the Prior Art

There are many varieties of musical scales. However the most commonly used scale in the Western world is the seven tone diatonic scale. In the diatonic scale, the notes, or tones, are separated by whole and half steps in a specific pattern; two whole steps; a half step; three whole steps; and another half step. The strongest tone in a particular scale is the tonic tone or note, the first tone of the scale. The tonic serves as the central point for the organization of the other tones. The tonic also gives the scale its name. For example in the D major scale, D is the tonic note. Any of the 12 half steps which are included within an octave may serve as the tonic in a diatonic major scale. This means that there are 12 different diatonic major scales.

Music is harmonized in chords which are groups of three or more related tones sounded at the same time. The chords are built on the scale and the physical properties of the tones themselves. The chords and harmonics in a piece of music are usually based on the same scale. It can be said that they are in the same key. Therefore the formation of chords within the diatonic scale, the octave scale used in the Western world, depends upon the simultaneous sounding of three or more of the notes within that scale so as to make a harmonious sound.

The most commonly used chords in the diatonic scale include those major chords on the root or base note of the scale which is called the tonic chord. All major chords are composed of a base or root note, one note a major third above that root or base note and a third note, a perfect fifth above that root or base note. The major chords used in most popular music are those major chords which begin on the first note, that is the tonic chord; those which begin on the fourth note of the scale, which are called the subdominant chords; and those which begin on the fifth note of the scale, which are called the dominant chords. Another frequently used chord is the chord which begins on the second note of the diatonic scale which is called the supertonic chord. These four chords, the tonic, subdominant, dominant and supertonic, are the most frequently used chords in music of the Western world. Therefore the major chords for all 12 notes in the chromatic scale must be available in order for music to be played in any selected key.

The strings of stringed instruments, including the guitar, are placed in tension so that each string produces a definite sound or fixed note when plucked in the open position. By tradition, the six strings of the guitar, from the low to the high end, are tuned as follows: E-A-D-G-B-E. To raise the pitch of any string by one half step, the string is depressed above the nut behind the first fret on the neck of the guitar. For successive raises of one half step in pitch, the strings can be depressed over successive frets up the neck of the guitar toward the body. To play a chord on the guitar, three or more of the strings are plucked while they are open or depressed to produce the notes required in a particular chord.

Stringed musical instruments such as guitars and ukuleles, are typically provided with a body, neck and head portion. A plurality of strings are strung longitudinally along the neck portion from the body to the head where they are wound around pegs by which the strings may be tuned. Longitudinally disposed on the neck adjacent to the head is normally a finger board having a plurality of transversely extending frets between which the strings may be depressed against the finger board for producing a particular note on each string.

To produce a particular chord, the instrument player depresses the strings, between appropriate frets, with the fingers of one hand while strumming or picking the strings with the other hand near the instrument body. Relatively complicated fingering of the strings on the finger board may be required to produce the desired chords. All four fingers and, many times, the thumb of one hand may be required for properly fretting the strings. A certain amount of dexterity and nimbleness is also required for properly fretting the strings. Even if the instrument player is an accomplished musician, it may be impossible to finger some of the strings on some stringed instruments. For example, it is easy to see that one might not be able to finger all six strings of a six-stringed guitar at the same time.

Due to the complex fingering required, many physically handicapped people are precluded from the pleasure of playing a stringed musical instrument. Furthermore, although they do not have what is considered a physical handicap, many people are unable to place their fingers in the proper positions to form chords on a stringed instrument, due to the thickness or shortness of their fingers.

Previous efforts have been made at providing some mechanical means of chording freted stringed instruments. However, most of these efforts have resulted in apparatus which is extremely limited in the number of chords formed. The chord selectors of the prior art also may require increased finger pressure to depress the desired strings for producing a particular chord. Examples of chord selectors of the prior art are shown in the following U.S. Pat. Nos.: 745,557—Baker; 2,450,210—Sprague; and 2,669,151—Maccaferri.

SUMMARY OF THE PRESENT INVENTION

In the present invention, a mechanical chord selector is provided for attachment to a stringed musical instrument. The chord selector may comprise: a support carriage, a plurality of string depressors mounted on a support carriage for movement between non-engaging positions to positions engaging the strings of the musical instrument; a plurality of selector keys carried by the support carriage; and an operating assembly connecting the selector keys and the string depressors and responsive to movement of any one of the selector keys to move selected ones of the string depressors from non-engaging positions to positions engaging the strings for producing a preselected musical chord on the instrument. Each of the string depressors is associated with one of the instrument strings and is mounted for

movement independently of any other string depressor.

With the chord selector of the present invention, a large number of chords may be produced. In the embodiment to be described herein, for use with a six-string guitar, 12 different chords can easily be played. With such an embodiment four string depressors are associated with each string and all of the six strings may be played simultaneously.

In addition to providing a large number of chords, the chord selector of the present invention provides a means by which even physically handicapped people can enjoy the pleasure of playing a stringed instrument. Chording of the instrument can be accomplished by using one finger of one hand. The chorder on the present invention may also be used by those people who are unable to place their fingers in proper positions to form chords. Furthermore, the chorder of the present invention provides a means by which people who have a limited knowledge of music can play a stringed instrument without the attendent teaching and practice normally required.

In addition to the foregoing operational advantages offered by the present invention, it is simply and economically manufactured. Other objects and advantages of the invention will become apparent from the description which follows in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

In the description which follows, reference will be made to the accompanying drawings in which:

FIG. 1 is a top plan view of a chord selector according to a preferred embodiment of the invention for use with a conventional six-stringed guitar;

FIG. 2, taken along lines 2—2 of FIG. 1, is a cross-section elevation view of the chord selector of FIG. 1;

FIG. 3, taken along line 3—3 of FIG. 2, is an enlarged plan view detail of a portion of the chord selector of FIGS. 1 and 2 directly above the strings of the instrument to which it is attached; and

FIG. 4 is an elevation view, partially in section, taken along line 4—4 of FIG. 3, showing details of the string depressors and operating assembly of the chord selector of FIGS. 1-3.

DESCRIPTION OF A PREFERRED EMBODIMENT

Referring now to the drawings, a chord selector according to a preferred embodiment of the invention, will be described. The chord selector shown is for use with a six string guitar. However, it may be adapted for any stringed instrument of the type which is fretted.

The chord selector, which is designated in general by the reference letter A, may comprise a support carriage C, string depressors D, and an operating assembly comprising selector assembly S and force transmittal assembly F. The entire chord selector assembly may be attached to the neck N of a guitar G, such as is shown in FIGS. 1 and 2 by a clamp device K.

The carriage C may comprise a fixed plate **11**, a pair of end plates **12** and **13**, and various structural bracing **14** which may also include a pair of fixed shafts **15** and **16**. The fixed plate **11** is mounted directly above the strings **2** of the guitar and may be provided with a plurality of apertures in which the depressors D are mounted. These apertures are arranged so that there is one aperture behind each of the first four frets for each of the six strings **2**. In other words for the six string guitar shown in the drawings, there would be **24** apertures.

As previously stated, a string depressor is mounted in each one of the apertures of fixed plate **11**. As best seen in FIG. **4**, each one of the string depressors D may comprise a plunger **20** at the upper end of which is a head portion **21** and at the lower end of which is a string contacting tip **22**. The tip **22** is of a material suitable for depressing the strings **2** without cutting the strings or introducing undesirable noises. Mounted around the plunger **20** beneath head **21** is a spring member **23** which biases the string depressor D away from engagement with strings **2**. If this biasing is overcome, the string depressor D may be forced into contact with strings **2** causing the string to contact the fret of the guitar directly in front of that particular string depressor D. Thus a particular note can be produced just as if the string were depressed by the finger of a guitar player.

The selector assembly S includes a plurality, 12 in the present case, of selector keys **31, 32** on the end of an equal number of pivotedly mounted selector levers **33**. One of the fixed shafts **17** serves as a pivot about which these levers **33** are mounted. The purpose of the selector keys, **31, 32** and lever **33** is to select the notes of a particular chord which are to be played on the instrument to which the chord selector is attached. Thus each one of the selector keys **31, 32** represents a particular chord, for example, in the present case the twelve major chords of the diatonic scale.

The chord selector is provided with an operating assembly which connects the selector keys **31, 32** and levers **33** to the string depressors D in such a manner that the appropriate strings are depressed for producing the selected chord. This operating assembly may be said to include a plurality of selector assemblies S and force transmittal assemblies F. There is one selector assembly S for each chord and one force transmittal assembly F for each string depressor.

Each force transmittal assembly includes a rocker-like cam device **41** which is pivotedly connected at **42** to the fixed plate **11** and rests against the head **21** of one of the depressor plungers **20**. Connected to the cam device **41** by another pivot connection **43** is a link member **44** which is pivotedly connected at its opposite end to a crank member **45**. The crank member **45** is mounted for arcuate movement on the fixed shaft **16** and is connected at its opposite end to operating lever **46**. One end of operating lever **46** is mounted on shaft **15** for pivoting movement about its axis. In the free resting position of FIGS. **2** and **4**, the string depressors D assume a position not engaging the strings **2**. However, if a downwardly directed force is applied to operating lever **46**, at some point to the right of crank **45** as shown in FIG. **2**, the cam member **41** is pivoted in a counter-clockwise direction forcing the plunger **20** downwardly against the biasing of spring **23** until tip **22** contacts and depresses the particular string therebelow.

The purpose of the selector assemblies is to select and operate the force transmittal assemblies necessary for producing the desired notes in a particular chord. In addition to a selector key **31, 32** and selector lever **33**, each selector assembly comprises a selector bar **51**,

a connecting rod **52** and a set of pushrods **53**. The pushrods **53** lying beneath a particular bar **51** make up a set. Thus in the embodiment shown, there are twelve sets of pushrods **53** associated with each selector bar **51**. The pushrods of each set are arranged such that they are disposed over the operating levers **46** associated with a particular string depressor D necessary for depressing the particular string **2** for producing the notes required in the selected chords. Thus one selector key **31, 32** may be depressed causing one to six strings **2** to be depressed at the appropriate frets for producing that particular chord by strumming the string. Each pushrod **53** may be provided with a split end **59** similar to a clothes pin, which straddles the end of operating lever **46**. The pushrods are biased by springs or other means (not shown) in a direction away from the lever **46**.

The selector bars **51** are mounted in the carriage end plates **12** and **13** for arcuate movement about a fixed axis. By pressing on a particular selector key **31, 32**, a particular connecting rod **52** is moved downwardly causing a particular selector bar **51** to be rotated applying a downwardly directed force to its associated set of pushrods **53**. This causes the force transmittal mechanism F lying directly below each pushrod of that set to be actuated. Actuation of the selected force transmitting mechanisms F causes the associated string depressor D to contact the underlying string **2**, placing the string in a condition for playing the particular notes required in the chord. The number of string depressors activated can be anywhere from one to six depending upon the notes required in the chord. For example, the number of string depressors and pushrods associated with the selector bar **51** furtherest to the right, as viewed in FIGS. **1** and **2**, is six. Thus, all six strings of a guitar may be fretted so as to produce the three notes required for a particular chord. This is contrary to conventional fingering in which two or three strings are very often omitted due to the impossibility of fingering all of the strings at once. It is obvious that the location of pushrods **53** in each set can be changed.

Each selector assembly may be provided with a biasing spring **55** which biases the selector assembly toward an inoperative or non-engaging position relative to the lever **46** of force transmitting assembly F. Thus only by depressing or operating one of these selector keys **31, 32** can a set of pushrods **53** be operated.

It will be noticed that the arrangement of levers **33** and **46** provide a means by which a force applied to one of the keys **31, 32** can be multiplied and transmitted through a mechanical advantage to the string depressors D. This is an obvious advantage over chord selectors of the prior art, many of which require as much or greater force to operate than the force normally applied by a player's fingers when fingering or depressing the strings in a conventional manner.

As can be seen from the foregoing discussion, the chord selector of the present invention offers a means by which the strings of a musical instrument can be positioned or depressed for the production of a chord involving at least three notes or tones. This is done by operating or depressing a single selector key associated with that particular chord. Thus, a physically handicapped person or a person whose fingers are not easily positioned on the proper strings can easily manipulate and play a stringed musical instrument. Furthermore, the chord selector of the present invention enables those who have not had extensive practice or exposure to music to play a stringed instrument, such as the guitar. All that is necessary is to know which chord is required and which selector key represents that chord. Most music, particularly guitar music, is written with the chord designation printed above the musical score.

It should be apparent that all strings of the guitar may be involved in a chord, eliminating the necessity of choosing which strings should be strummed or picked. It should also be apparent that an unlimited number of chords is possible by slight variations of the exemplary embodiment of the invention. Every note in a chromatic scale may be produced with the chord selector of the invention.

Although only one embodiment of the present invention has been described herein, many variations will be apparent to those skilled in the art. It should also be obvious that the present invention may be adapted for use with stringed instruments other than the guitar, the guitar being the most common anticipated use. Thus it is intended that the scope of the invention be limited only by the claims which follow.

I claim:

1. A chord selector for a stringed musical instrument comprising: a support frame attached to said musical instrument; a plurality of string depressors mounted on said support frame and independently movable between first positions, not engaging the strings of said musical instrument, and second positions engaging said strings; a force transmittal assembly mounted on said support frame associated with each of said string depressors and including a cam device for moving said associated string depressor from said first position to said second position, said cam device being connected by a crank member to an operating lever for movement of said cam device and said string depressor; a plurality of selector levers carried by said support frame; a plurality of selector bars, each one of which is associated with and connected to a particular one of said selector levers; and a plurality of push rod sets, each set of which represents a particular musical chord, in registration with preselected ones of said operating levers, each set of said push rods being operable by an associated selector bar in response to movement of an associated selector lever to simultaneously operate said preselected operating levers for producing said particular musical chord on said instrument.

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