Feb. 27, 1962 J. W. LUCAS 3,022,698

UNIFORM PIANO KEYBOARD

Filed March 7, 1957

FIG. 1.

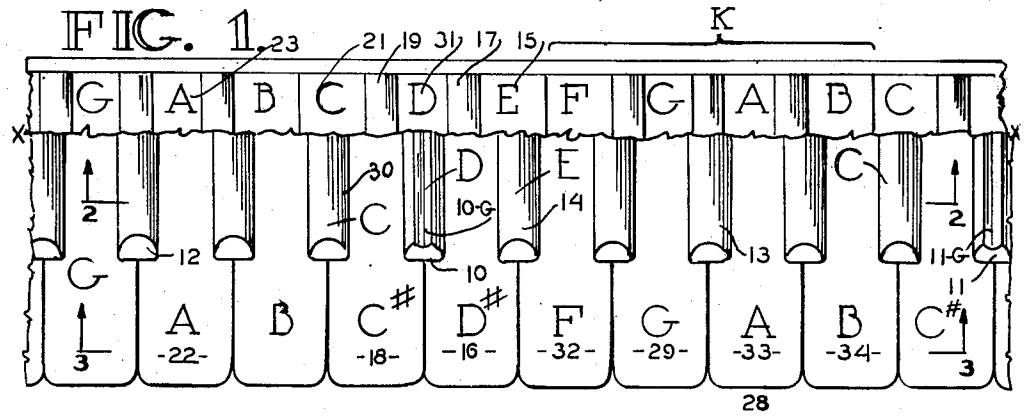


FIG. 2.

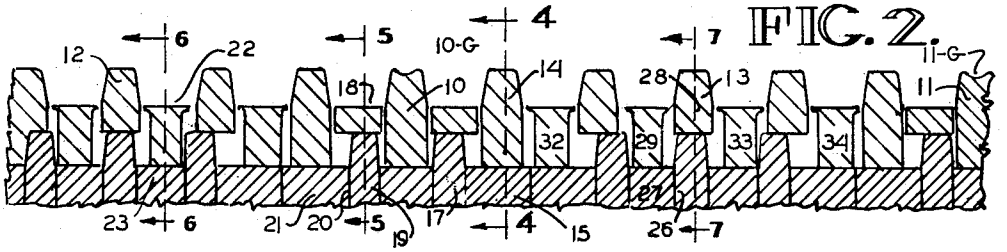


FIG. 3.

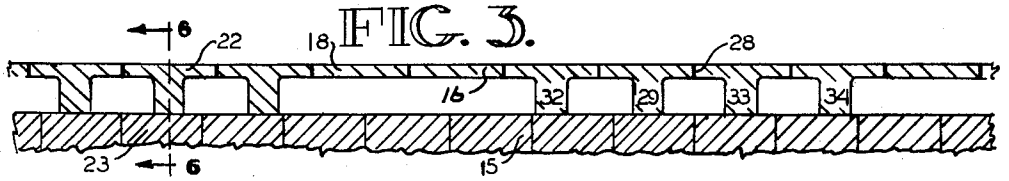


FIG. 7.

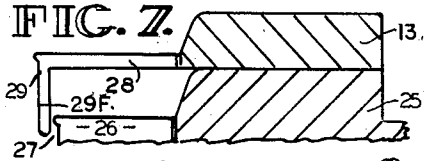


FIG. 4.

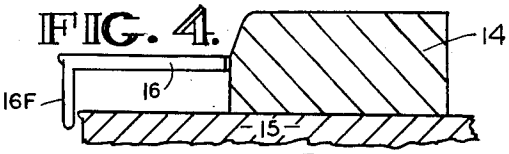


FIG. 8.

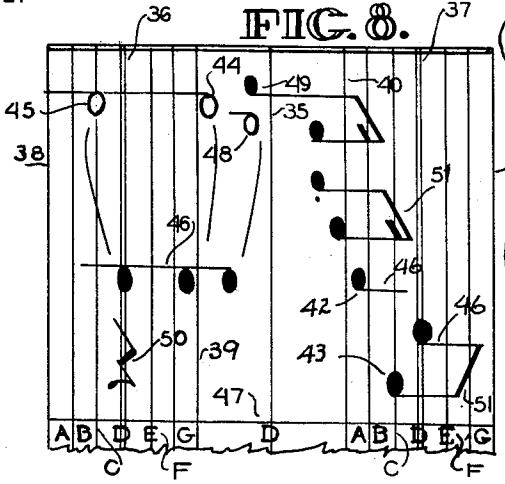
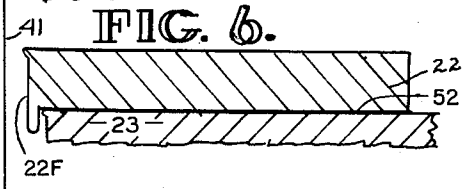


FIG. 5.

FIG. 6.



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UNIFORM PIANO KEYBOARD

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7 Claims. (Cl. 84—423)

This invention relates to pianos and the playing of music thereon, and more particularly to a set of removable keys which are adapted to be superimposed upon the keys of a conventional piano to provide a continuous full keyboard of alternate white and black keys, each differing by a half-note from each key adjacent thereto, together with a cooperating method of scoring piano music on a vertical staff in which each line represents a black key and each space a white key in the revised keyboard.

As is generally known, the improved arrangement of a piano keyboard substantially as suggested above, has been set forth and promulgated by various inventors in the past. Also, a considerable amount of experimentation has been conducted relative to certain improved methods of scoring music on horizontal and vertical staffs. However, all of the revised keyboard systems suggested have required substantial re-arrangement of the mechanical elements of the piano, and in many cases involved the use of a plurality of keyboards which were presumed to facilitate the transposition of music from one key to another.

However, none of the systems disclosed and described heretofore has been implemented by its inventor with a practical and expeditious means of changing a presently conventional piano to the improved keyboard arrangement of his invention, nor has there been a simple and properly correlated method of scoring music to provide a direct and obvious relationship to the revised keyboard and thereby eliminate the necessity of first reading the notes on the music, then translating them in terms of the respective keys to which they refer.

In fact, the arrangements suggested for piano keyboards and the music scoring methods associated therewith have been so costly to incorporate into actual musical instruments and so difficult to learn in spite of their alleged simplification, that the systems, at least insofar as my investigations have revealed, have never been reduced to practical forms in which they could be offered to the public at reasonable cost.

My invention has been made with the foregoing considerations in mind and will be seen to have a plurality of important objects.

One important object of my invention is the provision of a set of over-keys being superposable upon and removably attachable to the keys of a conventional piano, and being adapted when so attached to provide a keyboard consisting of alternate black and white over-keys, each being effective when pressed to produce a tone one half-note different from that produced by either of the two adjacent over-keys.

Another important object of my invention is the provision of a set of over-keys of the character described which may be readily attached or removed from the keyboard of a conventional piano without changing or defacing the keys of the conventional piano in any way.

A further important object of my invention is the provision of a set of over-keys of the character described and being adapted to facilitate the transposition of music from one key to another by using the same relative finger positions for chords when starting with any over-key of the same color as the fundamental of the basic chord.

An additional important object of the present invention is the provision of a set of over-keys of the character described in which differently conformed surfaces are used on certain of the keys to facilitate tactual identification thereof by the pianist so as to place the music at any predetermined point within a certain octave.

A still further important object of my invention is the provision of an improved staff and scoring method being adapted to provide a readily recognizable relationship between the lines and spaces on the staff and the black and white over-keys of the improved keyboard.

Another object of my invention is the provision of a set of over-keys and a music scoring method related thereto of the character described being adapted to enable the reading and playing of the bass and treble by means of the same staff-to-keyboard relationship, and in which there is a specific place for each full and half-note on the written scale without the use of chromatic interval notations on the written score.

In brief, my invention includes a set of over-keys adapted for removable attachment to the keys of a conventional piano, and being effective to provide a uniform piano keyboard of alternately spaced black and white over-keys, each producing a sound tone one half-note higher than the one therebelow. Additionally, my invention includes a music scoring method directly related to and cooperating with the uniform arrangement of the over-keys, including a vertical staff on which the music is scored from top to bottom and the lines and intermediate spaces relate respectively to black and white over-keys. Thus there is a specific position on the scoring staff for each of the over-keys within the normal playing range on the uniform keyboard, and the use of chromatic interval notations, such as sharps, flats and natural signs, is completely eliminated.

Because of the direct relationship thus established between over-keys on the uniform keyboard and lines and spaces on the staff, it is unnecessary for the pianist to think in terms of individually identified notes on the scale, such as *a*, *a*-sharp, *c*, etc., or to keep in mind a particular key in which music is to be played, such as the key of six sharps, as is required in the case of music written in the conventional manner; the pianist thinks merely in terms of lines and spaces on the staff and the black or white over-keys on the uniform keyboard which they represent.

Certain possible variations in the embodiment hereinafter described, and other objects of my invention will become apparent upon examination of the following specification together with the references contained therein to the drawings, of which:

FIGURE 1 is a diagrammatic plan view of a uniform piano keyboard comprised of a set of over-keys constructed according to my invention, shown superposed over the keys of a conventional piano keyboard;

FIGURE 2 is a sectional view taken transversely through the over-keys and the keys of the conventional keyboard along the line and in the direction indicated by the arrows 2—2 in FIGURE 1;

FIGURE 3 is a transverse sectional view, similar to FIGURE 2, but taken along the line and in the direction of the arrows 3—3 in FIGURE 1, showing in section the white keys of a conventional keyboard with the white over-keys superposed thereon;

FIGURE 4 is a sectional view taken along the line and in the direction indicated by the arrows 4—4 in FIGURE 2, showing a black over-key which is adapted to engage a white conventional key;

FIGURE 5 is a similar sectional view taken along the line and in the direction indicated by the arrows 5—5 in FIGURE 2, showing a white over-key adapted to operate a black conventional key;

FIGURE 6 is a similar sectional view taken along the line and in the direction indicated by the arrows 6—6 in FIGURE 2, showing a white over-key adapted to operate a white conventional key.

FIGURE 7 is a similar sectional view taken along the

line and in the direction of the arrows 7—7 in FIGURE 2, showing a black over-key attached to and adapted to depress a black conventional key, and

FIGURE 8 is a plan view of the vertical staff of my invention on which notes are disposed on lines relating to black over-keys and in white spaces relating to white over-keys on the revised uniform keyboard.

Reference is again made to FIGURE 1 which shows one and one-half octaves of the uniform piano keyboard made possible through the use of the attachable over-keys constructed according to my invention.

For the sake of descriptive clarity in the following specification, it should be pointed out that I have arbitrarily adopted the term "over-keys" for use when referring to the attachable keys of my invention in order to differentiate between them and the conventional keys of the standard piano keyboard.

Likewise, for greater descriptive simplicity, the keyboard resulting from the use of the over-keys of my invention, will be referred to as the "uniform" keyboard instead of using one of the various less descriptive terms such as "Janko" or "harmonic" commonly found in musical terminology. The term used is meant to imply that the revised keyboard is uniform throughout since it is comprised of alternately black and white over-keys from top to bottom, with each key being effective to produce a note exactly one half-note higher or lower than that of the two adjacent keys.

In FIGURE 1 the inner portions of the conventional keys of a conventional piano keyboard are seen extending downwardly from the upper margin of the figure, and the standardized arrangement of the keys is readily recognized by the two immediately adjacent white keys indicated at B and C and at E and F. Disposed downwardly from the horizontal section line X—X, the over-keys of my invention are seen in respective superposition over the conventional keys, and the relationship of the over-keys in the uniform keyboard to those of the conventional keyboard thereunder can be readily understood.

As set forth in the stated objects of this invention, the principal purpose of the over-keys of my invention is to change a conventional piano keyboard to an harmonic scale arrangement in which each key is effective to produce a tone one half-note different from that produced by either of the two keys adjacent thereto, and in which the keys are alternately large and small and white and black.

To provide a relationship between the keys of the conventional keyboard and the uniform keyboard arrangement provided by the over-keys, readily distinguishable small over-keys such as 10 and 11 in FIGURES 1 and 2, are positioned at octave intervals throughout the keyboard, and are colored red and provided with grooves, as indicated at 10G and 11G in their upper surfaces. Thus, the grooved keys 10 and 11 are readily recognized visually and tactually by the pianist so that he remains constantly aware of his finger positions and playing range both on the uniform keyboard and with relation to the conventional keyboard therebelow.

To further assist the pianist in orienting himself visually relative to the uniform keyboard, each small over-key such as 12 and 13 disposed intermediate of each pair of red grooved over-keys such as 10 and 11 is finished in a generally neutral color, such as grey, thereby breaking what would otherwise be a series of five consecutive black or small over-keys between each pair of red over-keys.

The over-keys are attached to the upper surfaces of the conventional keys by means of strips of double surface pressure sensitive adhesive material indicated by the heavy line designated by the numeral 52 in FIGURE 6, and consequently may be quickly attached and are readily removable. Pressure upon the over-keys while playing the instrument serves to more securely attach the superposed over-keys.

The manner in which the over-keys rest and bear upon the conventional keys of the piano can be seen in FIGURE 1 and may be better understood by reference to FIGURE 2 which is taken along the section line and in the direction of the arrows indicated by the numerals 2—2 in FIGURE 1.

Actually, only four types or shapes of individual over-keys are required to form the superposed uniform keyboard, and a better understanding of the conformation of these individual over-keys and the manner in which they engage the conventional keys may be had from FIGURES 4 to 7 in which they are shown.

Classified and described functionally, the four types of over-keys include a deep, black over-key engaging a convetnional white key; a shallow white over-key effective to engage and depress a conventional black key; a deep, white over-key engaging a conventional white key, and a shallow, black over-key engaging a black conventional key, as seen respectively in FIGURES 4, 5, 6 and 7.

The deep, black over-key 14, shown in FIGURE 4 which is a longitudinal section taken along the line and in the direction indicated by the arrows 4—4 in FIGURE 2, is attached to and serves to depress the white conventional key 15, and three over-keys of this type are used in each octave in superposition over the standard white keys indicated as C, D and E in FIGURE 1. One of these three over-keys is given a distinctive color, such as red, and as has been previously explained is grooved along its upper surface as shown at 10-G in FIGURES 1 and 2. One red over-key of this type is attached to the conventional key for the note D in each octave. The surface 16 seen in FIGURE 4 is actually the facing edge of the white over-key 16 extending outwardly beyond the end of the black over-key 14, and attached to the black conventional key 17 as can be seen in the sectional view of FIGURE 2.

In the sectional view of FIGURE 5, which is taken along the line and in the direction of the arrows 5—5 in FIGURE 2, the white over-key 18 is shown disposed over the conventional black key 19, and the surface indicated by the numeral 20 is the facing edge of the conventional white key 21, which can be seen in section in FIGURE 2 and fragmentary plan view in FIGURE 1. Only two white over-keys of this type, such as 16 and 18, are required in each octave of the uniform keyboard, and are attached to the black keys 17 and 19 disposed oppositely adjacent the keynote D in the conventional keyboard. As can be seen in the sectional views of FIGURES 4 and 5, the white over-keys 16 and 18 are provided with vertically disposed facia portions 16F and 18F respectively which are extended outwardly beyond the outer ends of the conventional keys so as to cover and conceal the surfaces of conventional keys such as 15 and 21 without interference with them when depressed.

The type of white over-key adapted to rest upon and depress conventional white keys is shown in the sectional view of FIGURE 6 which is taken along the line and in the direction of the arrows 6—6 in FIGURES 2 and 3, the over-key being designated by the numeral 22 and the conventional key as 23. Four over-keys of this type are used in each octave, being disposed upon the keynotes F, G, A and B of the conventional keyboard. The over-key 22 and another over-key 29 of this type, the vertical edge 28 of which appears in FIGURE 7, are provided with vertical facia portions 22F and 29F, respectively, which are vertically disposed in horizontal alignment with the other facia portions such as 16F and 18F mentioned above. Over-keys of this type are T-shaped and, as will be understood from the sectional views of FIGURES 2, 3 and 7, the over-key 29 may be depressed without touching the conventional white key 27 or the conventional black key 25.

In FIGURE 7 a black over-key 13 which is adapted to engage and depress a black conventional key 25 is seen in a sectional view taken along the line and in the direction indicated by the arrows 7—7 in FIGURE 2. Also

seen in FIGURE 7 are the vertical lateral surfaces **26** and **28** of the conventional white key **27** and the white over-key **29** respectively. Three keys of this type are used in each octave of the uniform keyboard and are superposed upon the black keys disposed between the keynotes F, G, A and B of the conventional keyboard.

In experiments relative to my invention, the over-keys have been attached to the upper surfaces of the conventional keys by means of double surface pressure sensitive adhesive strips indicated at **52** in FIGURE 6, which served to hold the over-keys firmly attached yet readily detachable when desired without requiring any modification of the keyboard itself or causing any damage to the surfaces of the conventional keys.

Actually a substantial portion of each octave, as indicated by the letter K in FIGURE 1, is the same in the uniform keyboard as in the conventional keyboard, each of the conventional keys from F through B having thereon an over-key of the same black or white type except that the G sharp over-key is colored grey instead of black in order to facilitate visual identification of the key within the range of the octave. The purpose of the over-keys within this range is, of course, to bring the level of the pressure surfaces of these conventional keys upwardly into coplanar alignment with the other over-keys of the uniform keyboard.

As will be readily understood by reference to FIGURE 1, the conventional keynote C indicated by the numeral **21** is depressed by means of the black over-key **30**, and the white over-key **18** is superposed upon the conventional black key **19** and is thereby effective to produce the half-note C sharp. Likewise the black over-key **10** depresses the white conventional key **31** to produce the note D, and the white over-key **16** depresses the black conventional key **17** and is therefore effective to produce the inter-tone D sharp. Similarly, the black over-key **14** depresses the white conventional key **15**, thereby producing the note E. These are the only major changes in the uniform scale and, of course, are repeated consistently in each octave.

In the sectional view of FIGURE 3, which is taken along the line and in the direction of the arrows **3—3** in FIGURE 1, only the white keys are shown; those of the conventional keyboard being shown fragmentally with the white over-keys of the uniform keyboard positioned thereon. As previously mentioned, the keyboards are the same from the keynotes F through B, and the white keys F, G, A and B are seen in the figure to be engaged by the white over-keys **32**, **29**, **33** and **34**, whereas the conventional keynotes C, D and E are actuated by black over-keys not seen in FIGURE 3, and the white over-keys **16** and **18** engage the conventional black keys **17** and **19** respectively.

In FIGURE 8 the uniform music scoring staff arranged to complement and cooperate with the uniform keyboard made possible in accordance with my invention, is shown in a fragmentary plan view. As is apparent in the figure, the lines of the staff are disposed vertically and are arranged to provide a line for each black key and a white interspace between the lines for each white key. The bass and treble are combined in the same staff yet are divided visually by the vertical centerline **35**.

The centerline **35** is necessarily related to a particular over-key on the uniform keyboard which, in the case of the embodiment illustrated herein, is the grooved red over-key **10** shown in FIGURES 1 and 2. The closely spaced pairs of lines indicated at **36** and **37**, relate to similar grooved over-keys being oppositely spaced from the centerline **35** by one octave, and the pairs of lines seen at **38** and **39** and **40** and **41** indicate grey keys defining octave ranges centered respectively relative to the lines **36** and **37**.

As shown in FIGURE 8, the space immediately adjacent the centerline **35** on each side thereof is not lined vertically. The blank area thus provided serves two purposes; it separates the bass and treble sections of the score, and provides an open area into which the treble may be downwardly extended or the bass upwardly extended according to the range requirements of the score thus avoiding confusion in the mind of the reader regarding the part to which the notes belong or the hand with which they should be played.

Indicia with which notes to be played are scored on the vertical staff are generally conventional in conformation and consist of solid ovular dots for those of quarter-note or lesser time value disposed between or upon the vertical lines as shown respectively at **42** and **43**. Notes of greater time value such as the half-notes **44** and **45** are also shown in the conventional manner as outline ovals, but it will be observed that the fine lines such as **46**, which indicate the sequential or simultaneous relationship in which the notes are to be played, are disposed transversely of the scale parallel to the horizontal line **47** extending from the line **38** to the line **41** to indicate the end of a measure of time. It will be further observed that the fine lines are extended from the ovular bodies of the notes in the direction of the hand with which the notes are to be played as is illustrated in the case of the notes **48** and **49**. Other symbols, such as the rest **50** and time-indicating diagonal connectors such as **51**, are generally conventional and are positioned on the staff in directional relation to the hand of the player to which they are significant.

Although in order to comply with the statute the present invention has been described and illustrated in considerable detail in the form of a single and particular embodiment, it is to be understood that the details set forth herein are subject to change and modification, and the embodiment shown is subject to substantial variation and the invention itself is amenable to adaptation into a plurality of different embodiments and therefore it is not to be limited to the form or details shown herein nor restricted in any manner except as may be indicated by the extent of the following claims.

What I claim as my invention is:

1. Means for converting a conventional piano keyboard to a uniform keyboard in which black and white keys are alternately disposed throughout the entire length thereof, comprising: a plurality of variously conformed over-keys being superposable over the normally exposed portions of the conventional keys of a conventional piano keyboard; one-half of said plurality of over-keys being conformed in the general manner of black conventional keys, the other one-half of said plurality of over-keys being conformed in the general manner of white conventional keys; one-half of said black over-keys being of greater depth and adapted to rest upon white conventional keys, the other one-half of said black over-keys being of lesser depth and adapted to rest upon and effective to depress black conventional keys; one-third of said plurality of white over-keys being of lesser depth and adapted to rest upon and effective to depress black conventional keys, and two-thirds of said white over-keys being of greater depth and adapted to rest upon and effective to depress white conventional keys; adhesive means affixed to the bottom surfaces of said over-keys for removably attaching said over-keys in respective superposition to the upper surfaces of said conventional keys, and identification means defining longitudinal grooves in the upper surfaces of certain of said over-keys whereby the finger positions within a particular octave and relative to the entire uniform keyboard is readily determinable.

2. The invention in accordance with claim 1 being further characterized by the particular respective relationship in which said over-keys are superposed upon said conventional keys within each octave, which comprises: one of said black over-keys of greater depth being superposed upon each of the conventional white keys related to the notes C, D and E; one of said black over-keys of lesser depth being superposed upon each of the black conventional keynotes F-sharp, G-sharp and A-sharp; one of said white over-keys of lesser depth

being superposed upon each of the black conventional keynotes C-sharp and D-sharp, and one of said white over-keys of greater depth being superposed upon each of the conventional white keynotes F, G, A and B.

3. The invention in accordance with claim 2 in which said means for removably attaching said over-keys to the upper surfaces of said conventional keys comprises: a longitudinally extended strip of double surface pressure sensitive adhesive tape being adapted dimensionally to cover the entire downwardly extended undersurface of said over-keys and being disposed between said under-surface of said over-key and the upper surface of said conventional key as the former is superposed upon the latter, whereby digital pressure by a pianist while playing upon the upper surface of said over-keys is effective to press said over-keys into increasingly firm attachment.

4. Means for converting a conventional piano keyboard to a uniform keyboard having alternate black and white keys throughout its entire length, comprising: a plurality of variously formed over-keys superposable upon normally exposed portions of the keys of a conventional piano keyboard; one-half of said plurality of over-keys being formed in the general manner of black conventional keys, the other one-half being similar in planform to white conventional keys; one-half of said black over-keys being of greater depth and adapted to rest upon the white conventional keys related to the notes C, D and E in each octave, the other one-half of said black over-keys being of lesser depth and adapted to rest upon and effective to depress the black conventional keys related to F-sharp, G-sharp and A-sharp; one-third of said plurality of white over-keys being of lesser depth and adapted to rest upon the black conventional keys related to C-sharp and D-sharp, and two-thirds of said white over-keys being of greater depth and adapted to rest upon and effective to depress the white conventional keys related to the notes F, G, A and B; said black over-keys related to the note D in each octave having longitudinal grooves in their upper surfaces, and a distinctive coloration, such as red, applied to the entire outer surfaces thereof; and adhesive means for removably attaching said over-keys to the upper surfaces of said conventional keys, said adhesive means including strips of double surface pressure sensitive adhesive tape disposed between the downwardly extended under surfaces of said over-keys and the upper surfaces of said conventional keys, whereby digital pressure imposed by a pianist upon the upper surfaces of the over-keys is effective to press the over-keys into increasingly firm attachment with the conventional keys thereunder.

5. Means for identifying certain over-keys as set forth in claim 4 and further characterized by additional means comprising: said black over-key of lesser depth which is superposed upon said black conventional keynote identified as G-sharp being provided with a generally neutral external finish other than black, and one of said neutrally

finished over-keys being disposed intermediate of each adjacent pair of said distinctively colored upwardly grooved over-keys throughout the entire length of said uniform keyboard.

6. In a plurality of variously formed over-keys adapted for use in converting a conventional piano keyboard to a uniform keyboard having alternate black and white keys throughout, a white over-key adapted to be superposed directly upon and attached to the upper surface of a white conventional key, comprising: a generally rectangular main body portion having an upwardly and normally horizontally disposed playing surface, and having opposite lateral notches therein to interfit with and receive the laterally adjacent black over-keys, the sides of said main body being undercut beneath said playing surface to provide a generally T-shaped cross section in said body forwardly of said notches with opposite lateral recesses in which adjacent white conventional keys on either side are received when said white over-key is depressed; and a facia panel formed integrally with said main body extended downwardly from said playing surface at the end thereof spaced from said lateral notches, and adapted to cover and conceal said T-shaped cross sectional form of said main body; said facia panel being disposed outwardly of the outward ends of said white conventional keys so that said white over-key, when attached to one of said white conventional keys, may be depressed without also engaging and depressing another adjacent white conventional key.

7. The combination comprising four different types of over-keys adapted for use in converting a conventional piano keyboard to a uniform keyboard having alternate black and white keys throughout, including: a black over-key of lesser depth adapted to be superposed directly upon a black conventional key; a black over-key of greater depth adapted to be superposed directly upon a white conventional key; a first white over-key adapted to be superposed directly upon a black conventional key and having space in its underbody in which the outer portions of white conventional keys disposed thereunder are received when said first white over-key is depressed; and a second white over-key adapted to be superposed directly upon a white conventional key and having undercut laterally opposite longitudinally disposed recesses in its underbody in which portions of adjacent white conventional keys on either side are received when said second white over-key is depressed.

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