

Feb. 4, 1964

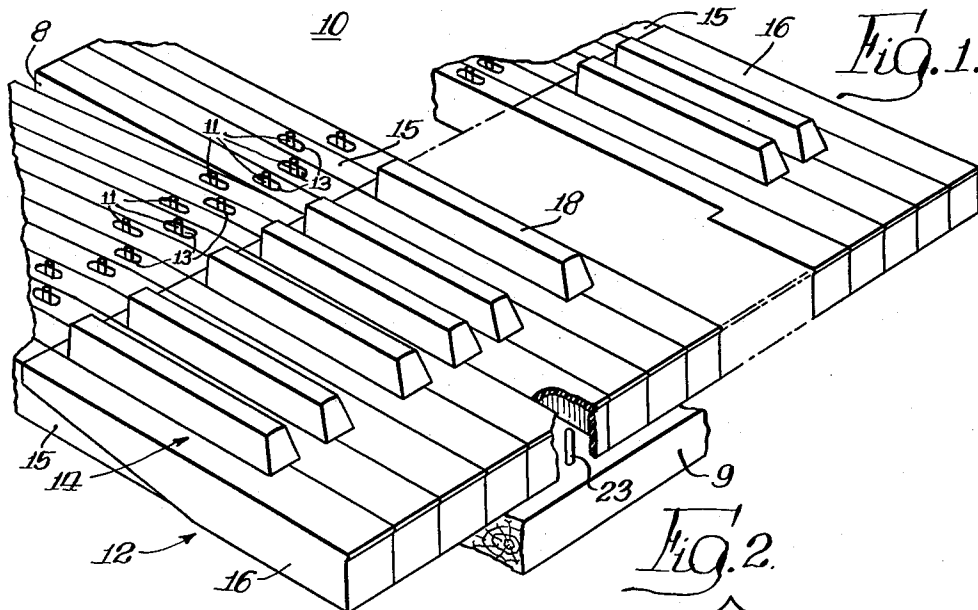
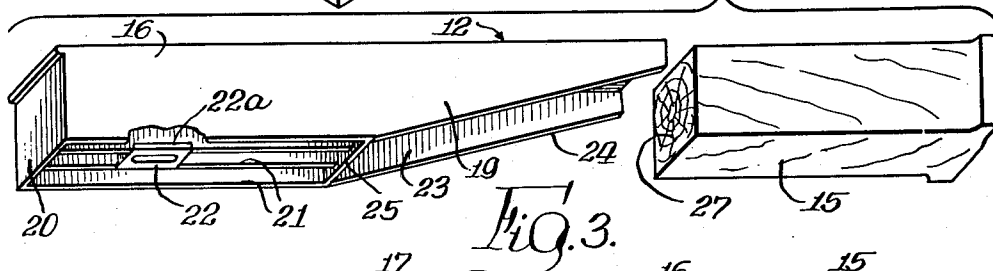
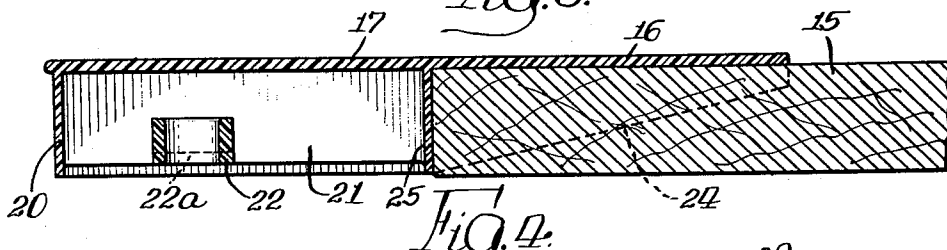
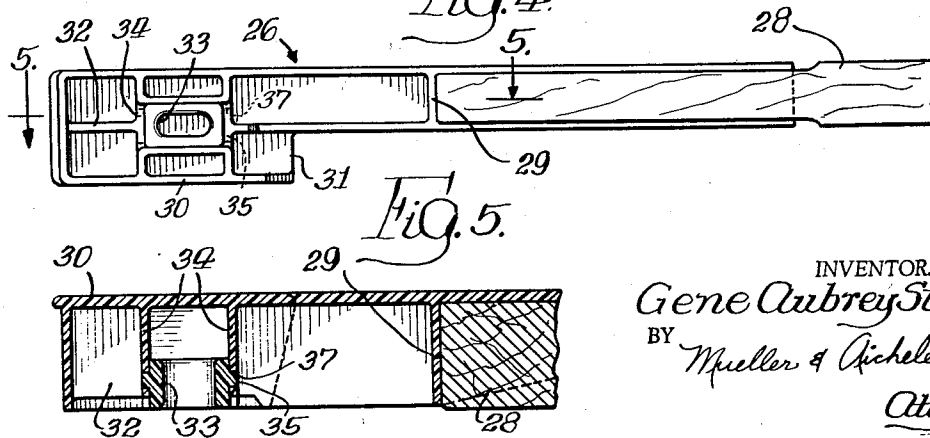
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3,120,146

MUSICAL INSTRUMENT KEY

Filed June 2, 1961

2 Sheets-Sheet 1



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MUSICAL INSTRUMENT KEY

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2 Sheets-Sheet 2

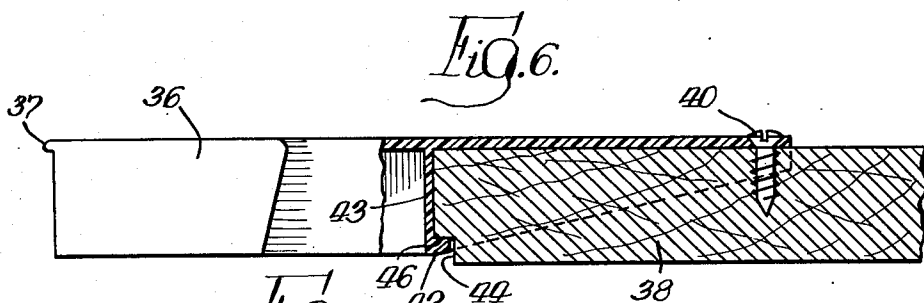
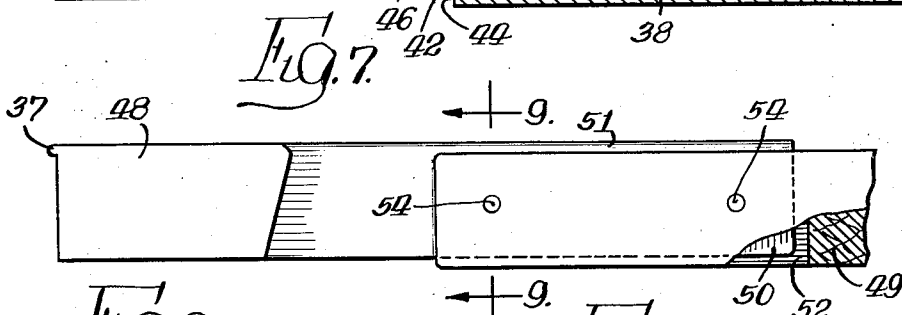


Fig. 9.

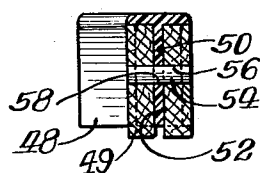
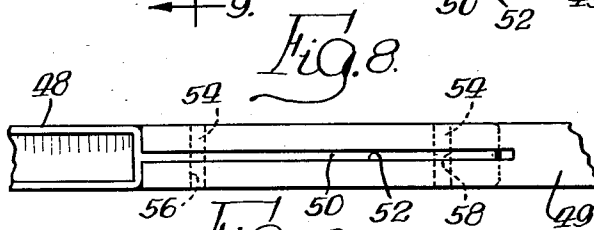


Fig. 10.

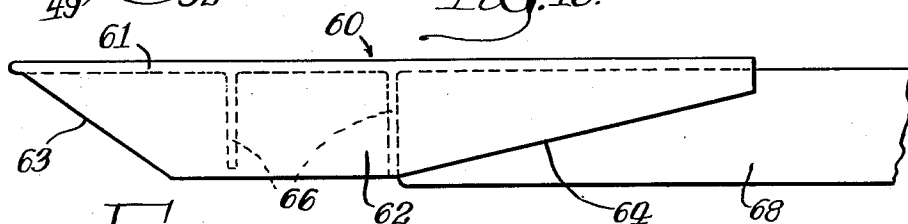
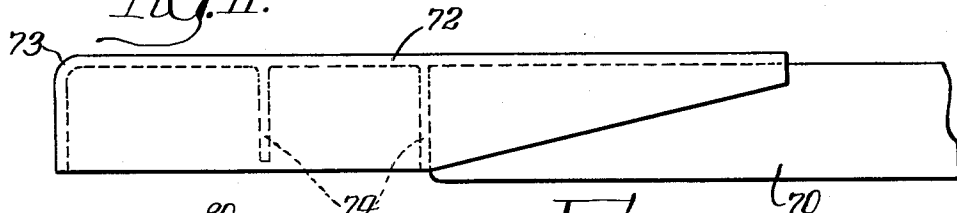
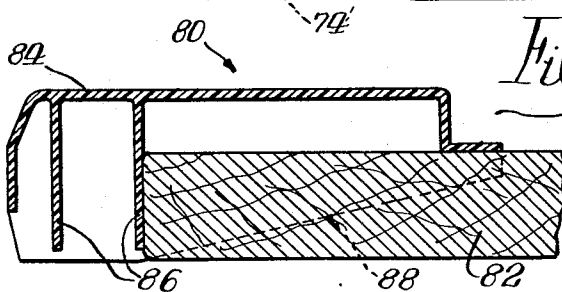


Fig. 11.



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3,120,146

MUSICAL INSTRUMENT KEY

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5 Claims. (Cl. 84-433)

This invention relates to musical instruments and more particularly to key assemblies for keyboards adapted to initiate tones from a musical instrument.

In the past, keys for pianos and other musical instruments have been formed of wood with a top and front covering of ivory or plastic to provide an attractive appearance and smooth, comfortable feel to the person playing the instrument. Key assemblies of this type were provided by forming a rough keyboard by securing together pieces of wood and cutting the same to the required size. Pieces of ivory or plastic were then secured to the front edge of the keyboard and other pieces of ivory or plastic to the top thereof. As the natural keys have offset shapes, this required costly cutting and machining operations of the wooden members as they must conform to rigid tolerances in order that the finished keys would have the required configurations.

Various attempts have been made in the past to provide molded keys but a difficult problem has been presented because of the different dimensions of the various keys, and the consequent large number of individual dies required. In addition, since the keys could not be interchanged, complete key replacement has been necessary in many cases of minor damage to one or more keys of the instrument.

It is an object of the present invention to provide a new and improved key assembly for musical instruments.

Another object of the present invention is to provide a keyboard having molded key fronts for mounting upon wooden key shanks.

Still another object of this invention is to provide a molded plastic musical key front possessing strength and rigidity for long continuous operation.

A further object is to provide a new and improved key with a molded plastic front including guiding provisions for the key.

A feature of the present invention is the provision of relatively rigid molded plastic key fronts of various shapes adapted to be secured to the standard wooden key shanks in a musical instrument keyboard.

A further feature of this invention is the provision of molded plastic key fronts for use with standard wood key shanks, each front having a hollow body portion formed with a front, top and parallel elongated sides, and having a plurality of ribs formed therein to afford strength and stability thereto. The key fronts may be secured to the wood shanks by adhesive, by the use of screws or pins, and/or by providing inter-engaging portions on the front and shank.

Another feature is the provision of a hollow molded plastic key front having a plurality of longitudinal and transverse intersection ribs and a plastic guide bushing secured to the ribs.

In the drawings:

FIG. 1 is a fragmentary perspective view of a musical instrument keyboard assembly constructed in accordance with the invention;

FIG. 2 is an exploded view of a wooden shank and plastic key front assembly, including a molded plastic bushing;

FIG. 3 is a longitudinal half section view of the key assembly which is shown in FIG. 2;

FIG. 4 is a bottom view of a different musical instru-

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ment key assembly in accordance with the present invention;

FIG. 5 is a cross sectional view taken on lines 5-5 of FIG. 4;

FIG. 6 is a longitudinal view partly in section of the key assembly including screw type mounting means;

FIG. 7 is a side elevational view partly in section of a further embodiment of the present invention;

FIG. 8 is a bottom fragmentary view of the key assembly of FIG. 7;

FIG. 9 is a cross-sectional view taken on lines 9-9 of FIG. 7;

FIGS. 10 and 11 are side elevational views of further embodiments of the key assembly of the present invention; and

FIG. 12 is a longitudinal cross sectional view of a sharp key assembly constructed in accordance with this invention.

In accordance with the invention, keys for musical instruments, such as pianos, are provided by placing molded plastic key fronts upon key shanks constructed of wood or other material. The wooden shank is cut to approximate dimensions to receive the front portions. The molded plastic key fronts may be mounted in a plurality of ways, as by the use of adhesive, by threaded screws, or by providing inter-engaging portions on the key front and shank. The various forms of keys are molded with the required construction to fit together to form a keyboard. The natural keys are molded with offset portions or shoulders adapted to accommodate sharp keys therebetween in the standard manner. Rigidity is provided in the molded plastic cap portions by means of a plurality of intersecting ribs formed within the hollow portion of the cap, to effectively form a support therein. These ribs may be formed longitudinally, transversely or both.

Molded plastic bushings for engagement with positioning pins on the keybed may be secured to the ribs formed in the hollow portions of the key fronts. In this manner, the ribs secure the bushing in place and at the same time give the key fronts the necessary rigidity.

Referring now to the drawings, in FIG. 1 there is shown a fragmentary portion of keyboard 10 for a piano comprising natural keys generally indicated at 12 and sharp keys generally indicated at 14. The sharp keys 14 are positioned in offsets in the natural keys 12 and extend above the natural keys. The natural keys 12 comprise an elongated wooden shank portion 15 and a molded plastic front portion 16, mounted upon the shank portion 15 and extending therefrom. The sharp keys 14 likewise comprise an elongated wooden shank portion 15 and a molded plastic front portion 18 mounted thereupon. The front portions 16 and 18 extend beyond the front ends of the wooden shanks (FIGS. 2 and 12). The shank portions 15 extend at various angles as is required to provide spaces 8 therebetween for portions of a piano action (not shown) to extend. The shank portions include openings 13 for receiving balance pins 11 of the keybed 9, and the front portions include guide bushings 22 (FIG. 2) which receive guide pins 23 in the keybed.

It is pointed out that in a standard keyboard the natural keys extend forward of the sharp keys and are wider at the front to fill the space in front of the sharp keys. This presents a problem in the construction of the keys when the keys are formed from a wood blank as the notch or offset in the natural keys makes it difficult to cut the individual keys from the preformed rough blank. The shanks of the keys however all rest side by side, and although they are slanted to make the required coupling to the action, there are no sharp offsets to be cut as at the front parts of the keys.

FIG. 2 illustrates in exploded view the construction

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of one of the keys 12 comprising a front portion 16 which is adapted to be fixedly mounted upon a wooden shank portion 15. FIG. 3 is a longitudinal half sectional view of this key with the front portion 16 fixedly mounted upon the wooden shank 15. The front portion 16 has a top wall 17 and side walls 19 which form a channel mating with the end of the shank portion 15, and which may be fixed to the wooden shank portion 15 by any suitable adhesive.

The front portion is formed of a molded plastic material and includes a front wall 20 and a cross wall 25 to form a hollow structure. It will be seen that the cross wall 25 engages the end 27 of the shank 15 when the front portion 16 is assembled thereto. Longitudinally extending ribs 21 are formed in the hollow portion between the front wall 20 and the cross wall 25. The side walls 19 have ramped edges as shown at 24. In this manner a substantial amount of plastic material is saved since any of the keys 12 may only be depressed to an extent wherein the upper parts of the side walls 19 of the adjacent keys are exposed.

A molded plastic bushing 22 is bonded to ribs 20 formed in front key portion 16. This bushing cooperates with a guide pin in the keyboard to hold the key properly aligned thereon as shown in FIG. 1. The bushing may have edges 22a which rest in slots in the ribs 21 to provide a secure attachment thereof to the ribs.

FIG. 4 is a bottom view of a piano key 26, comprising an elongated wooden shank 28 and a molded plastic front portion 30. The shank extends into the plastic front portion to the wall 29. In the view it is seen that the molded plastic front portion 30 has an offset 31 to provide a space for an adjacent sharp key. The plastic front portion may have both longitudinally extending ribs 32 and radially extending ribs 34 molded therein. These ribs afford a surface upon which the bushing 33 for receiving the guide pin is secured and, in addition, provide rigidity to the plastic front portion 30. FIG. 5 is a cross sectional view showing the particular rib construction in the plastic portion 30 and showing the mounting of the bushing 33 thereon. The bushing 33 has projections 35 which extend in slots 37 provided in the ribs 34.

In FIG. 6 the front key portion 36 is mounted upon a wooden shank member 38. The portion 36 is maintained affixed to the shank 38 by cap screw 40. It will be noticed in this embodiment that a flange 42 is formed upon the lower end of wall 43 of the front portion 36, and fits into a notch 44 formed in the wood shank portion 38. The flange 42 engages shoulder 46 provided by the notch 44, and together with screw 40 provides a rigid connection of the front portion 36 on the shank portion 38.

FIGS. 7, 8 and 9 show still a further embodiment wherein the plastic front portion 48 has an elongated solid rib 50 extending downwardly from the top wall 51 thereof. The rib 50 fits into a slot 52 (FIG. 8) formed in the wooden shank portion 49. In this embodiment pins 54 are inserted vertically through the wooden member 49 and the flange 50 to hold the front and shank portions assembled. FIG. 9 is a sectional view taken on lines 9-9 of FIG. 7 showing the pin 54 extending through aperture 56 formed in the wooden portion 49 and through aperture 58 formed in the rib 50.

In FIGS. 1-9 the piano keys illustrated have a straight front wall and an extending edge 37 formed at the top thereof, as has been commonly used. An organ key may also be manufactured in accordance with this invention wherein the molded plastic front portion 60 has a flat top portion 61 with sides 62 having slanted front edges 63 and ramped back edges 64. This is shown in FIG. 10. The organ key plastic front portion 60 may have transverse ribs 66, and may be mounted upon the wooden shank portion 68 by a suitable adhesive. In the case of organ keys, the mold is such that the under surface of the key is not covered. However, it is apparent that a key of this type need not have a completely closed body portion as

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the underneath area is not visible when the key is assembled in the organ.

Another configuration of the key is shown in FIG. 11. This "waterfall" type key also comprises a molded plastic front portion 72 secured to a wooden shank portion 70. The rounded edge 73 may be easily provided by the mold. Ribs 74 are formed in the plastic front portion 72 between the side walls. Here again the under area of the key cap portion is open.

FIG. 12 shows a sharp key 80 wherein a wooden shank portion 82 has a molded plastic front portion 84 mounted thereon and held thereto by means of an adhesive. These plastic portions are commonly molded of a material which is black or some other dark color. Vertically extending ribs 86 are formed in the plastic front portion to provide rigidity. The side walls may be ramped as shown at 88.

It will be understood that any suitable adhesive may be used in the practice of the present invention to secure the front portions to the shank portions of the keys. These portions may be connected by other suitable means as has been illustrated by FIGS. 6-9 of the drawings.

The invention provides therefore a key having a molded plastic front portion adapted to be mounted upon, and extend beyond, a wooden shank of a key assembly for a musical instrument keyboard. The shank portions may be constructed in a known manner. As the offset front portions are separate from the shank, the manufacture of the wood key shanks is greatly simplified. The offset configurations are provided entirely by the plastic front portion which may be molded in the desired shapes. The plastic portions may be of any suitable material capable of being molded into the configuration disclosed.

I claim:

1. In a keyboard for use in a musical instrument and including a keybed having pivot pins and guide pins thereon, a key assembly including in combination, a substantially rectangular elongated wooden key shank member having an opening adapted to receive a pivot pin on the keybed, an integral molded plastic key front portion having a top wall, a front wall and two longitudinally extending side walls and a back wall to define a hollow cavity, a plurality of longitudinally extending ribs formed in said cavity, a plurality of transverse ribs in said cavity intersecting said longitudinally extending ribs, said top wall and said side walls extending beyond said back wall to define a channel having substantially smooth interior surfaces, said molded plastic key front portion being fixedly disposed upon one of said shank members and extending longitudinally therefrom, said interior surfaces of said channel mating flush with corresponding surfaces on said shank member, and a molded plastic bushing member secured to said ribs and adapted to slidably engage a guide pin on the keybed.

2. In a musical instrument having a keyboard with natural keys having front portions which are interposed with sharp keys, and with all the keys having shank portions positioned side by side, a keyboard assembly including in combination, a plurality of substantially rectangular elongated wooden key shank members, means at one end of each of said shank members for coupling the same with the instrument, a plurality of integral molded plastic channel shaped key front portions with interior surfaces thereof mated flush with corresponding surfaces on the other ends of said wooden shank members and extending forwardly therefrom, each of said front portions being formed with a top portion, a transverse wall extending downwardly with respect to said top portion, and longitudinally extending side walls, said molded plastic front portions having at least one longitudinally extending rib formed therein, and at least one transverse rib extending between the side walls of said front portion and intersecting said longitudinally extending rib, and said side walls extending rearwardly of said transverse wall and having their lower edges slanted up-

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ward toward said top portion, each side wall thereby defining a generally triangular portion rearward of said transverse wall.

3. In a musical instrument having a keyboard, a key assembly including in combination, an elongated wooden shank portion having an end adapted to be coupled to the musical instrument, an integral molded plastic hollow front portion, said front portion including a top wall, a front wall and side walls defining a hollow channel, rib means formed in said hollow channel to afford rigidity to said key front portion, the interior surfaces of said hollow channel rearward of said rib means being substantially smooth, said front portion being mounted upon the other end of said shank portion with the interior surfaces of said hollow channel rearward of said rib means mating with corresponding surfaces on said shank portion.

4. In a musical instrument having a keyboard with natural keys having front portions which are offset and interposed with sharp keys and with all the keys having shank portions positioned side by side, a key assembly including in combination, an elongated wooden key shank member having a substantially rectangular cross section, said shank member having means at one end thereof for coupling with the instrument and a second end having

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a slot therein, and an integral molded plastic key front portion formed with a top wall, a front wall, and longitudinally extending side walls extending downwardly with respect to said top wall, said molded plastic front portion having a rib extending downwardly from said top wall and into said slot in said shank member for holding said front portion assembled to said shank member.

5. In a musical instrument keyboard, a key assembly including an elongated wooden shank portion of substantially rectangular cross section, a molded plastic front portion formed with a top and a transverse rib and two side walls extending downwardly therefrom, an outwardly extending flange formed on said transverse rib spaced from said top of said front portion, said shank portion having a notch to receive said flange when said front portion is mounted upon said shank portion, and screw means disposed through said top of said front portion and into said wooden shank portion and cooperating with said flange to hold said front portion assembled to said shank portion.

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