United States Patent

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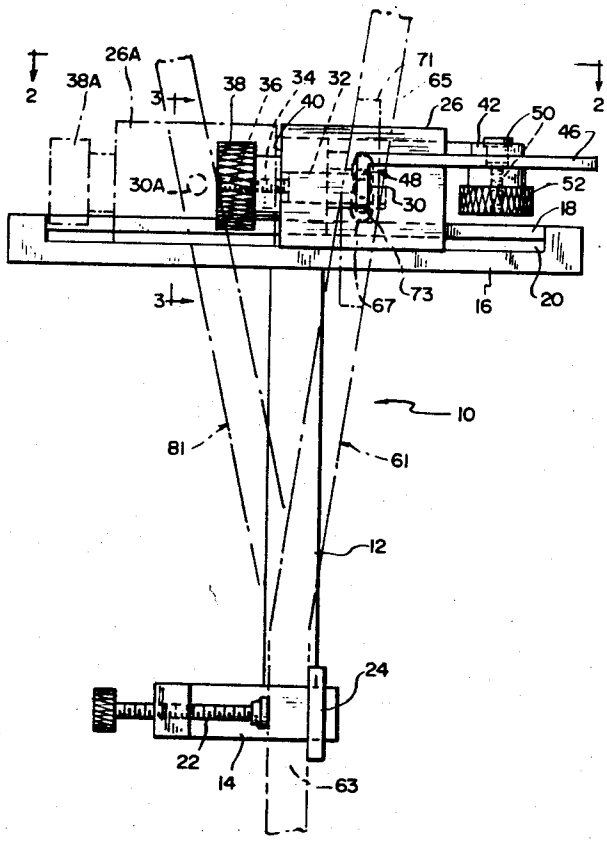
[54] **ALIGNMENT DEVICE**
10 Claims, 3 Drawing Figs.

[52] U.S. Cl. 84/458
[51] Int. Cl. G10g 7/00
[50] Field of Search 84/453, 458, 423, 433, 436, 438

[56] **References Cited**
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ABSTRACT: A device for aligning an aperture of a piano key button with a front portion of a key has a base with a key support at one end, while its other end has a pair of spaced rails defining a slot. A pin holder is slidably mounted in the slot and carries a pin adapted to extend into a balance pin aperture of the key. An arm is secured to the pin holder and has a pin engaging member mounted thereon for engaging a tip of the pin carried by the holder.

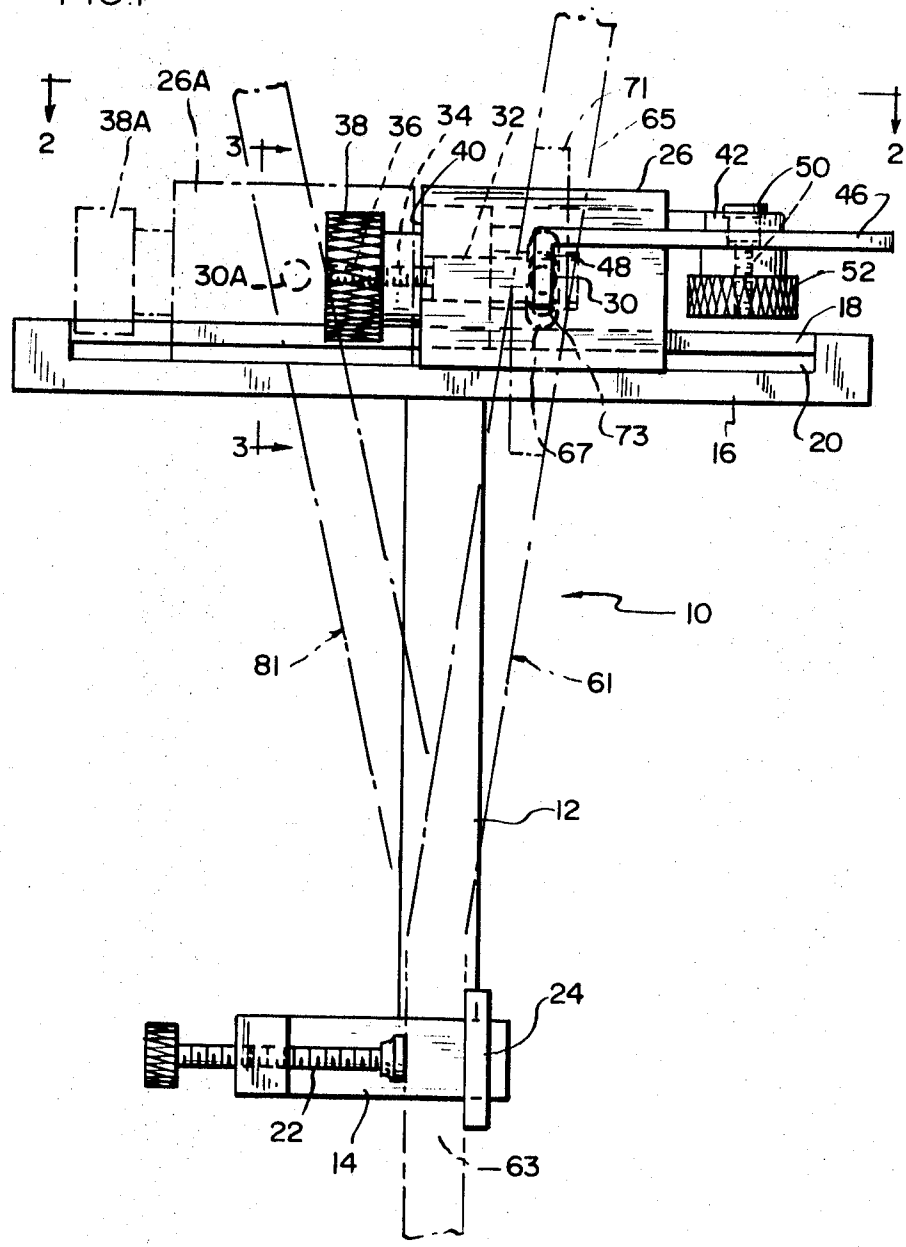


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SHEET 1 OF 2

FIG. 1



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FIG. 2

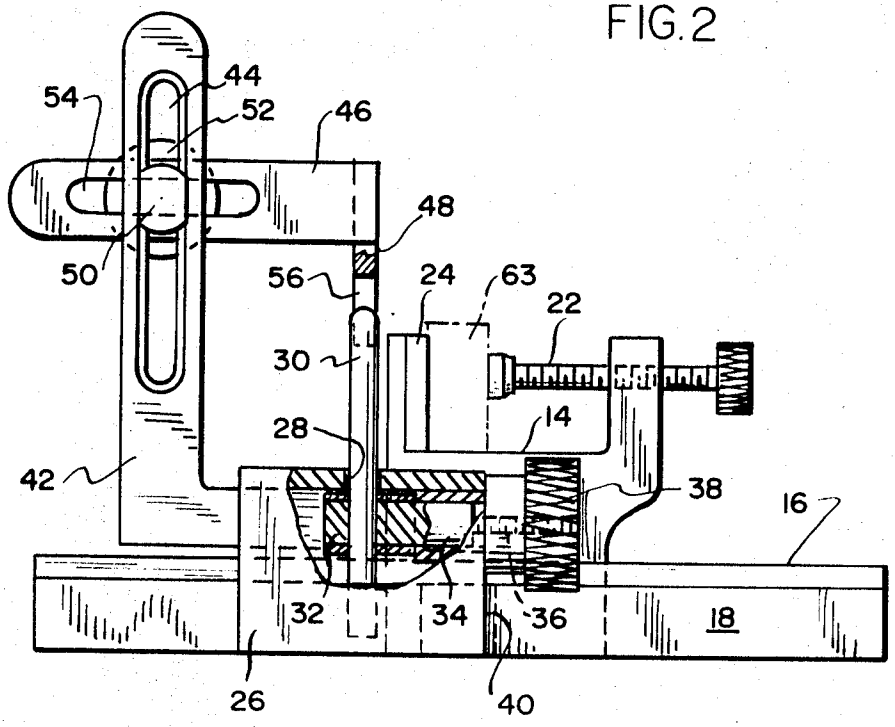
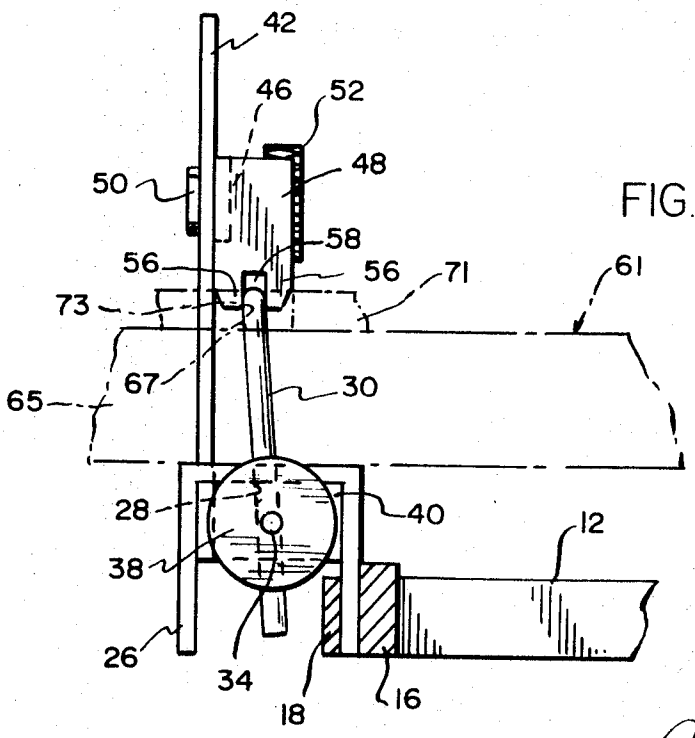


FIG. 3



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ALIGNMENT DEVICE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a device for aligning a key button with a key of a musical instrument and, more particularly, to a device for automatically aligning an aperture of a key button with a front portion of a key of a musical instrument such as a piano or the like.

2. The Prior Art

In the art of musical instruments, such as pianos, a number of keys have different angular configurations. The keys are provided with apertures in their shafts for mounting the keys on balance pins located in the piano. The aperture in the key is usually relatively large and may cause undesirable side motions of the key when placed on the pin. To overcome this condition and to stabilize the key on the pin, a substantially flat piece of wood or the like, known in the art as a key button, having an elongated pin receiving aperture, is placed over the balance pin in overlying relationship with the key shaft. The aperture in the key button has a bushing cloth placed about the edges thereof to prevent direct contact between the pin and the edges of the button.

The key buttons become worn out or break requiring replacement. To insure proper operation of the key, the long edges of the aperture of the key button must be in exact parallel alignment with the front portion of the key, that is, with that portion of the key which is touched by the fingers of the person playing the instrument. Heretofore, various means have been used to provide such alignment however, none of these means are acceptable for fast and efficient use so that achievement of the alignment has remained a lengthy and cumbersome procedure.

SUMMARY OF THE INVENTION

The present invention overcomes the disadvantages known in the prior art and allows for a fast and efficient alignment of the aperture of the key button with the key. Further, because of the nature of the device of the present invention, the same can be efficiently used by blind repairmen of musical instruments. Generally, the device consists of a base having at one end thereof a support for receiving a front portion of the key therein while the opposite end of the base is formed with a slot defined by a pair of spaced rails. A pin holder is slidably mounted in the slot and carries a pin which is a facsimile of a balance pin found in a musical instrument. An arm is secured to the pin holder and has a pin engaging member movably mounted thereon. The key is placed with its front portion in the support while its shaft is positioned over the pin so that the pin extends through the aperture in the key shaft. A key button is placed over the pin in overlying relationship with the key shaft. The pin engaging member enters the pin receiving aperture of the key button and contacts the tip of the pin. The support has a screw for tightening the front portion of the key within the support. Movement of the front portion of the key within the support, caused by the movement of the screw, moves the slidable pin holder along the slot and causes the long edges of the aperture of the key button to become aligned in parallel relationship with the front portion of the key.

DRAWINGS

FIG. 1 is a plan view of the device of the present invention with keys of a musical instrument and the moved position of the pin holder being indicated in phantom;

FIG. 2 is a sectional view taken generally along the line 2–2 of FIG. 1; and FIG. 3 is a sectional view taken generally along the line 3–3 of FIG. 1.

SPECIFICATION

Referring now to the drawings, more particularly to FIG. 1, there is shown an alignment device, generally designated 10.

The device comprises a base 12 having at one end thereof a supporting element 14 for receiving a front portion of a key of a piano, or the like, while the together end of the base has a pair of stationary, spaced, parallel rails 16 and 18, respectively, secured thereto and defining an elongated slot 20 therebetween.

The supporting element 14 has a movable member, such as a threaded screw 22, mounted on one side thereof, with a stop plate 24 secured to the opposite side of the element 14. The purpose of the screw and of the stop plate will be described in detail later.

Mounted in the slot 20 there is a pin holder 26 having a substantially inverted "U" configuration, as best seen in FIG. 3. A top surface of the pin holder is formed with a relatively small aperture 28 through which a pin 30, movably mounted within the pin holder, extends a desired distance above the top surface of the holder.

The pin 30 is a facsimile of a balance pin found in such musical instruments as piano or the like and is slidably mounted in a sleeve 32 within the holder 26, as best shown in FIG. 2. The sleeve 32, in turn, is rotatably mounted on a shaft 34 having an opposite threaded end 36 to which a knurled knob 38 is removably secured. When the knob 38 is tightened against the end 40 of the pin holder 26, the pin 30 will remain stationary since the end of the shaft 34 is pressed against the pin. By loosening the knob, the sleeve 32 and the pin 30 may be rotated to adjust the angle of inclination of the pin 30 with respect to the top surface of the pin holder 26 thereby simulating the exact angle of particular balance pin in a piano. Since balance pins in pianos may vary in height, the length of the pin 30 extending above the top surface of the holder may be varied. This variation is accomplished by loosening the knob 38 thereby releasing the pressure exerted by the end of the shaft 34 on the pin. When the pressure is released, the pin can be readily grasped in one's hand and pulled upward or pushed downward as desired.

An upstanding arm 42 is secured to the pin holder 26 and has an elongated slot 44 formed in the upper portion thereof.

A lever 46, secured to a pin engaging member 48, is pivotally mounted on a shaft 50 which is slidably secured in the slot 44 of the arm 42. A portion of the shaft 50 is formed with threads, the threaded end having a knurled knob 52 secured thereto. The purpose of the knob is to secure the lever at a desired angle and location in the slot 44. The lever 46 is formed with elongated slot 54 to insure movement of the lever toward or away from the pin 30. The movement of the lever 46 is accomplished by loosening the knob 52 and moving the lever to the desired position by hand. The pin engaging member 48, mentioned heretofore, is secured to one end of the lever 46 and is formed with a pair of spaced protrusions or teeth 56 defining therebetween an opening 58 adapted to engage a tip of the pin 30, as best illustrated in FIGS. 2 and 3.

In operation of the device, a key 61, taken from a piano and shown in phantom in FIGS. 1, 2 and 3, is placed in the device with the front portion 63 of the key located in the supporting element 14. A shaft 65 of the key has an aperture 67 for receiving a piano balance pin, or the pin 30 of the present invention. A number of piano keys have different angular relationships between their front portions 63 and their shafts 65. A new key button 71, having an elongated pin receiving aperture 73, is placed in overlying relationship with the key shaft 65 after a wornout or broken key button has been removed from the shaft. The pin 30 is adjusted to extend through the aperture 67 in the key shaft and through the aperture 73 in the key button. Usually, the aperture 73 has a bushing cloth placed about its edges to cushion the pin. The angle of inclination of the pin is adjusted to correspond to the angle of inclination of the balance pin in the piano associated with the key being repaired. The pin engaging member 48 is adjusted and positioned over the pin so that the tip of the pin 30 enters the opening 58 while the teeth 56 surround the pin and enter the elongated aperture 73 of the key button 71.

To insure proper operation of the key in the musical instrument, the long edges of the aperture **73** of the key button **71** must be in exact parallel alignment with the key front portion **63**.

This alignment is readily accomplished by using the present invention.

The screw **22** is moved against the front portion **63** of the key until said portion is tightly secured against the stop plate **24** within the supporting element **14**. As the front portion of the key is moved by the screw toward the stop plate **24**, the key shaft **65**, mounted on the pin **30**, causes the pin holder **26** to slide along the rails **16** and **18** in the slot **20** while the pin engaging member is in contact with the pin and the teeth **56** are in the aperture **73**. The movement of the front portion **63**, together with the sliding movement of the pin holder **26**, produces an automatic parallel alignment of the long edges, or the long horizontal axis, of the key button aperture **73** with the front portion **63** of the key **61** while the teeth **56** engage the aperture **73**.

Prior to placement of the key button **71** in an overlying position with respect to the key shaft **65**, the bottom of the key button may have adhesive applied thereto. Once the aforementioned alignment has been established, a small amount of pressure exerted on the key button by a hand, or the like, will cause the button to adhere to the key shaft maintaining the aforementioned parallel alignment.

As stated heretofore, some piano keys vary from the others in the angular relationships between their front portions and their shafts. As shown in phantom in FIG. **1**, a key **81**, having a different angular configuration from that of the key **61**, is located in the device **10** for alignment with a key button. The operation with respect to the key **81** will be identical to that heretofore described with respect to the key **61**. However, due to the different angular configuration of the key **81**, the pin holder **26** and other related elements will be moved to different positions to achieve the desired alignment. Thus, the pin holder **26** will become a pin holder **26A** when used in the alignment of the key **81**.

All elements identified by a numeral having "A" suffix represent like elements heretofore described but located differently in the device due to the use of the key **81** rather than the key **61**.

It should be readily apparent that the device of the present invention may be easily and efficiently operated regardless of the angular configuration of the key used.

I claim:

1. A device for automatically aligning a key button with the front portion of a key of a musical instrument, such as piano or the like, comprising:

a. a base having at one end thereof a supporting element for receiving the front end of a key of a musical instrument;

b. a pair of spaced, parallel, stationary rails at the other end of said base and defining a slot therebetween;

c. said supporting element having a movable member for engaging said front end of said key positioned therein and moving said front portion a relatively short distance within said element for securing said key tightly therein;

d. a pin holder carrying a pin adapted to extend into a pin receiving aperture of a key shaft positioned on said pin, said holder being slidably received in said slot and being movable therealong responsive to the movement of said front portion of said key within said supporting element;

e. an arm secured to said pin holder and having a pin engaging member movably mounted thereon for engaging a tip of said pin carried by said holder.

2. A device as defined in claim **1**, wherein said pin extends into a pin receiving aperture of a key button positioned in overlying relationship with said key shaft and having its aperture in registry with said aperture of said key shaft.

3. A device for automatically aligning a key button with the front portion of a key of a musical instrument, such as piano or the like, comprising:

a. a base having a key supporting element at one end thereof and a pair of spaced, stationary rails defining a slot therebetween and being positioned at the other end of said base;

b. a pin holder slidably mounted in said slot for movement therealong and carrying a pin adapted to extend into a pin receiving aperture of a key;

c. an arm secured to said pin holder and having a pin engaging member movably mounted thereon for engaging a tip of said pin carried by said holder.

4. A device as defined in claim **3**, wherein said supporting element receives the front portion of said key, said pin extending into the aperture of a shaft of said key.

5. A device as defined in claim **4**, wherein said supporting element has a movable member for engaging said key positioned in said element and moving said key a relatively short distance within said element for securing it tightly therein.

6. A device as defined in claim **5**, wherein the movement of said key within said supporting element causes movement of said pin holder within said slot.

7. A device as defined in claim **3**, wherein said pin holder has means for adjusting the height and the angle of inclination of said pin carried thereby.

8. A device as defined in claim **3**, wherein said pin engaging member is slidably and pivotally mounted on said arm.

9. A device as defined in claim **4**, wherein said pin engaging member extends into a pin receiving aperture of a key button positioned in overlying relationship with said key shaft and having its aperture in registry with said aperture of said key shaft.

10. A device for automatically aligning a key button with the front portion of a key of a musical instrument, such as piano or the like, comprising:

a. a base having a key supporting element at one end thereof and a pair of spaced, parallel, stationary rails positioned at the other end of said base and defining a slot therebetween;

b. a pin holder carrying an upstanding, pivotally mounted pin and being slidably received in said slot for movement therealong;

c. said pin being adapted to extend into a pin receiving aperture of a key of said musical instrument;

d. said pin holder having means for adjustably controlling the height and the angle of inclination of said pin;

e. an upright arm secured to said pin holder and having an adjustable pin engaging member slidably and pivotally mounted thereon for engaging a tip of said pin carried by said holder.