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GILL BOX

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FIG. 2

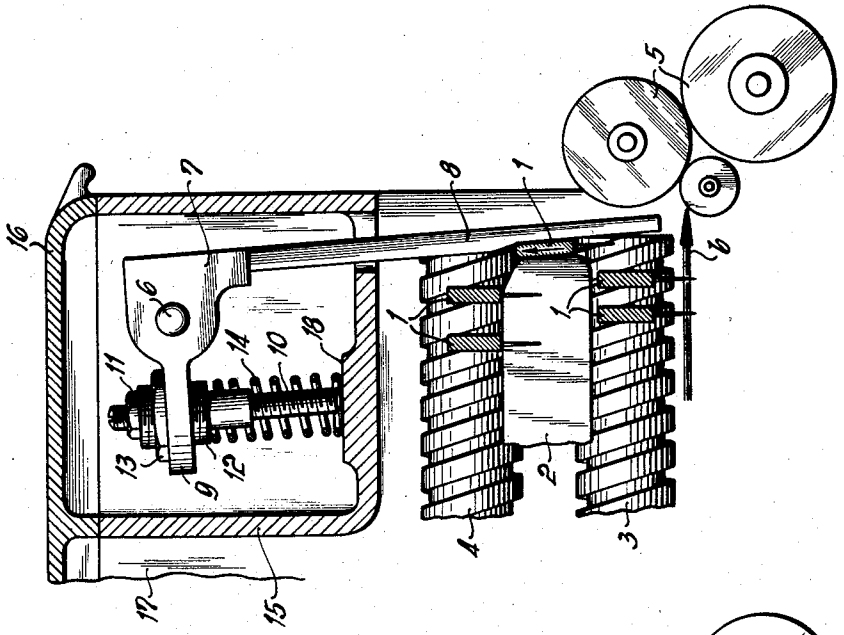
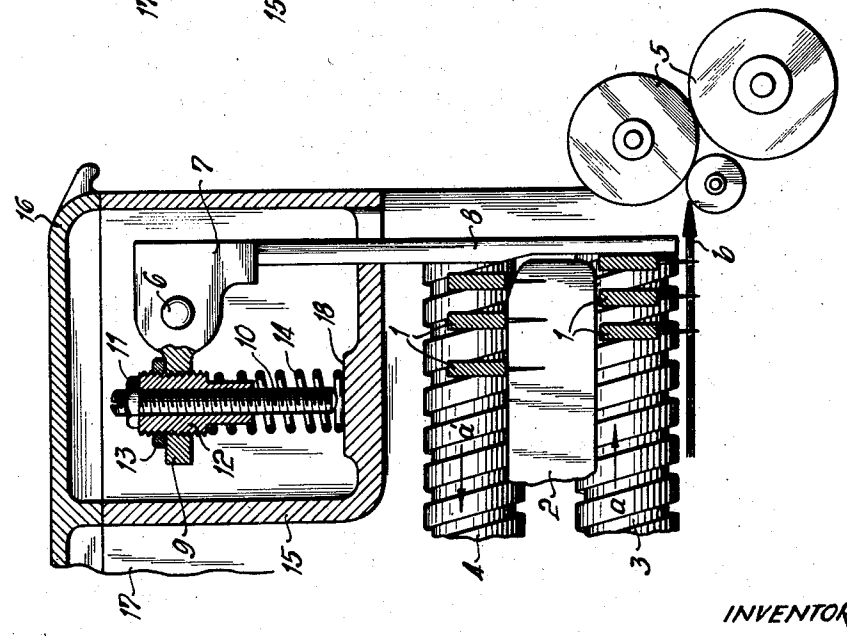


FIG. 1



INVENTOR
Johann Kaiser
By
Patent Agent

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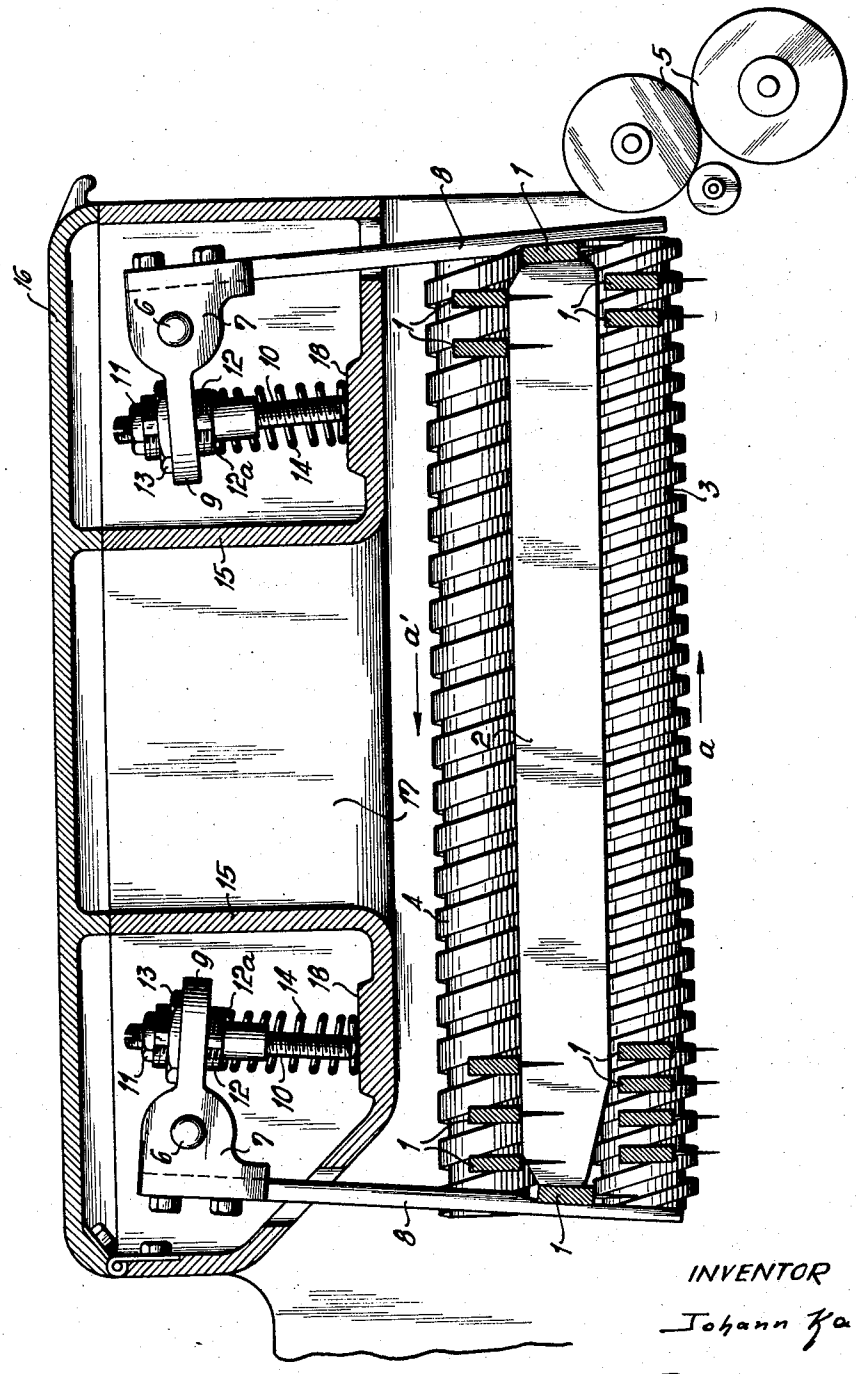

FIG. 3

INVENTOR

Johann Kaiser

By Patent Agent

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FIG. 4

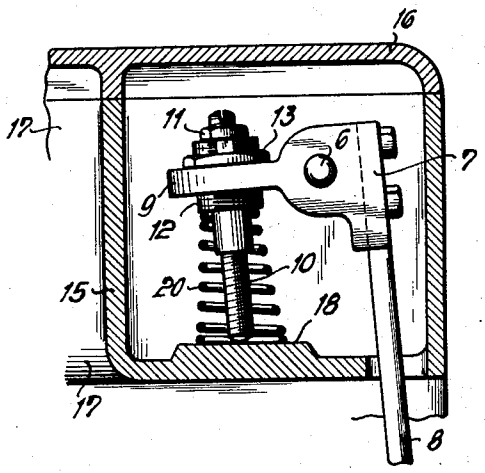


FIG. 5

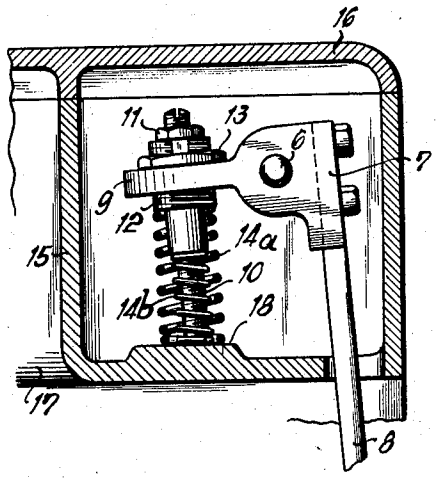


FIG. 6

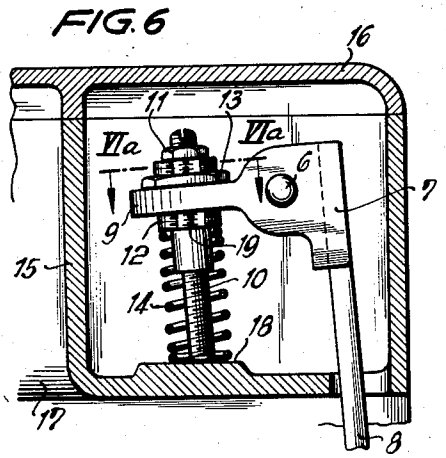


FIG. 6a

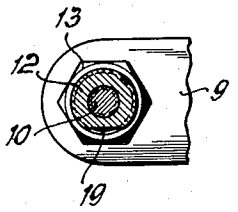
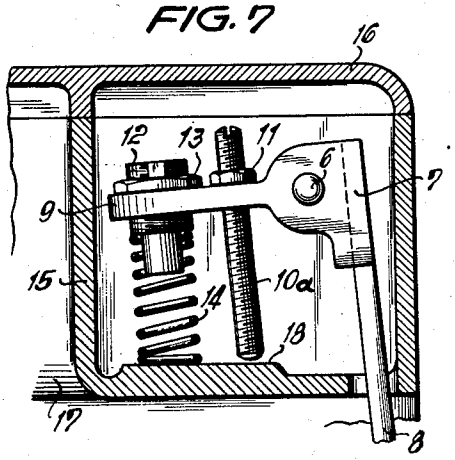


FIG. 7



INVENTOR

Johann Kaiser

By Walter Berlin

Talent Agent

United States Patent Office

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GILL BOX

Johann Kaiser, Waldshut, Baden, Germany, assignor to Chr. Mann, Maschinenfabrik, Waldshut, Baden, Germany

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Claims priority, application Germany June 10, 1954

8 Claims. (Cl. 19—129)

The present invention relates to textile machinery and, more particularly, to gill boxes.

With gill boxes (single or double gill boxes), the gill bars are guided by resiliently arranged abutments during their transport from the working spindle to the return spindle and from the return spindle to the working spindle. These guiding abutments furthermore serve the purpose of limiting the stroke of the gill bars in the working and also in the return direction so that they will not move beyond the beater blades and will not be pulled into the drafting cylinder mechanism by the fiber draft.

With heretofore known devices of the above mentioned type, the abutments are resiliently supported by providing one single tension spring for each two abutments namely a front and a rear abutment. This arrangement has the drawback that the tension of the spring for the abutments cannot be adjusted individually according to the most favorable value as must be the case particularly with modern high-speed gill boxes.

It is, therefore, an object of the present invention to provide a gill box which will overcome the above mentioned drawbacks.

It is another object of this invention to provide a gill box in which the tensioning of the spring of the abutments can be adjusted individually for the respective abutments.

These and other objects and advantages of the invention will appear more clearly from the following specification in connection with the accompanying drawings, in which:

Fig. 1 represents a diagrammatic section through the top portion of a gill box according to the invention, the abutment bar occupying its rest position.

Fig. 2 shows the arrangement of Fig. 1 with tilted abutment bar, a gill bar being about to change over from the working spindle into the return spindle.

Fig. 3 is a section similar to that of Fig. 1 showing the abutment bars at both ends of the feeding and return spindles.

Figs. 4 and 5 respectively show slight modifications of the spring abutment screw arrangement shown in Figs. 1 to 3.

Figs. 6 and 6*a* illustrate means which will permit a precise adjustment of the limit screw employed for limiting the maximum tilting angle of the respective abutment bars, Fig. 6*a* being a section along the line VI*a*—VI*a* of Fig. 6.

Fig. 7 shows a modification of the limit screw arrangement of Figs. 1 to 6*a*.

According to the invention, the abutment bars respectively arranged at each spindle end are each provided with an adjustable individual spring and with an adjustable abutment. More specifically, with reference to the drawing, the gill bars **1** are guided between guiding bars **2**, and, in working position, are driven by the working spindle **3**, whereas a return spindle **4** returns the gill bars, following their working stroke to the start of the working spindle. The movements performed by the gill bars during a cycle are indicated by the arrows *a*, *a'* (Figs. 1 and 3). The fibre band or sliver to be drafted moves in the direction of the arrow *b* (Figs. 1 and 2). As will be evident from the drawing, only the upper gill bar system and the upper portion of the machine are shown in the drawing. In order to prevent the gill bars at the end of their working stroke from dropping out of the working spindle **3** or from being pulled into the drafting cylinder system **5**, there is provided a limit abutment holder **7** which is pivotally supported by a pivot **6** so as to be able to tilt about the same. This holder **7** is of the shape of a bell crank lever and comprises a long abutment arm **8** and a short lever arm **9**. At the end of the working stroke, the gill bars abut the long arm **8** of the limit abutment and by means of a blade (not shown) or another conveyor means are conveyed to the return spindle **4** located above the working spindle **3**. In order to limit the tilting angle of the longer arm **8**, the shorter lever arm **9** is provided with a limiting screw **10** adapted to be tightened by means of a safety nut **11**. The threaded screw **10** is not directly screwed into the short lever arm **9** but is mounted on a threaded sleeve **12** which is secured by means of a nut **13**. The threaded sleeve **12** is provided with a shoulder **12***a* against which rests one end of a pressure spring **14** which tends to counteract the tilting movement of the arm **8**. The thrust of the spring **14** can be adjusted by the threaded sleeve **12**. The limiting screw **10** and the pressure spring **14** need not be concentrically arranged as shown for instance in Fig. 1 but may act upon the short lever arm **9** in any other desired manner as illustrated in Fig. 7 by limiting screw **10***a*.

Inasmuch as the abutment arm **8** is subjected to great wear due to the high number of strokes of the gill bars, the arm **8** is preferably exchangeably connected to a support **7** which carries the short lever arm **9**.

Fig. 2 shows the machine occupying a position in which the arm **8** is tilted while a gill bar is just about to move from the working spindle to the return spindle. In this tilted-out position of the arm **8**, the limiting screw **10** approximately touches the abutment surface **18**. The adjusted play between the limiting or adjusting screw **10** and the abutment surface **18** serves to compensate for tolerances in the thicknesses of the gill bars. More specifically, during the transfer of the gill bars from the working spindle **3** to the return spindle **4**, it is necessary for a smooth operation, to provide for a slight gap between the bottom end of screw **10** and the abutment surface **18** in order to avoid jamming of the gill bars due to unavoidable variations in thickness of the gill bars. At normal operation, the force of spring **14** suffices to guide the gill bars during their transfer from spindle **3** to spindle **4** closely along the guiding bars **2**. The limiting screw **10** contacts the surface **18** only when the fiber pull exerted by the drafting mechanism in the direction of the arrow *b* exceeds the force of spring **14**. In such an instance, the limiting screw **10** by its contact with surface **18** definitely limits the tilting angle of the respective bar **8**.

A further improvement of the spring will be obtained by employing as spring means two springs **14***a*, **14***b* of different lengths and with different characteristics as shown in Fig. 5, said two springs becoming effective one after another. A similar effect will be obtained by employing a spring **20** with progressively increasing spring diameter as shown in Fig. 4.

According to a further development of the invention, the threaded sleeve is provided with a scale **19** which with regard to the adjacent upper edge of the arm **9** furnishes indicating means for precisely setting the limiting screw. After the sleeve **12** has been set in con-

formity with the desired conditions, the sleeve 12 is secured in its respective position by nut 13.

In addition to the above mentioned advantage of allowing a precise setting or adjustment of the spring thrust and of the tilting angle for each individual abutment, it should be noted that the abutment members in the arrangement according to the invention are housed in head rail cross connections 15 in a substantially dust-proof manner, said connections being designed as hollow torsion-resistant bodies. The open top end of the cross connections 15 or the entire top rail is closed by a lid 16. This lid or cover 16 can be opened whenever desired so that the spring members are easily accessible and the gill bars can conveniently be removed through the opening 17. This closed upper rail arrangement has the additional advantage that the noise caused by the gill bars is considerably dampened toward the outside.

It is, of course, understood that the present invention is, by no means, limited to the particular construction shown in the drawings but also comprises any modifications within the scope of the appended claims.

What I claim is:

1. In a gill box comprising a plurality of gill bars and working and return spindles for effecting the working and return strokes of said gill bars, the combination of: two tiltably supported abutment levers, each of said levers having a first arm and a second arm, the first arm of each of said levers respectively being arranged at the ends of each of said spindles for respectively limiting the working and return strokes of said gill bars, a plurality of spring means respectively associated with said second arm of said abutment levers and arranged to continuously urge said first arm of the respective lever to move toward the adjacent spindle ends, and two rigid abutment members respectively associated with said second arms and individually adjustably mounted thereon for individually limiting the maximum tilting movement of said first arms away from the respective adjacent spindle ends.

2. In a gill box comprising a plurality of gill bars and working and return spindles for effecting the working and return strokes of said gill bars, the combination of: housing means arranged above said spindles, pivot means supported by said housing means, a plurality of abutment levers respectively pivotally supported by said pivot means, each of said levers having a first arm and a second arm, the first arm of each of said abutment levers respectively extending through said housing means into proximity of the end of each of said spindles for respectively limiting the working and return strokes of said gill bars, the second arms of said levers being arranged within said housing means, a plurality of spring means arranged within said housing means for engagement with the respective second arms, and individually adjustable set screw means respectively supported by said second arms and arranged for limiting the maximum tilting movement of the respective first arm of the lever away from the respective adjacent spindle ends.

3. In a gill box comprising a plurality of gill bars and working and return spindles for effecting the working and return strokes of said gill bars, the combination of: a plurality of tiltably supported two-arm abutment levers with one arm of each lever respectively arranged at the end of each of said spindles for respectively limiting the working and return strokes of said gill bars, a plurality of coil spring means respectively associated with the other arm of said levers for continuously urging the associated arm toward the adjacent end of the respective spindle, and individually adjustable screw means respectively arranged within said coil spring means for limiting the maximum tilting movement of said one arm of the levers away from the respective adjacent spindle ends.

4. An arrangement according to claim 3, in which each of said coil spring means is a double spring with different spring characteristics.

5. An arrangement according to claim 3, in which each of said spring means is a pressure spring with progressively varying characteristics.

6. In a gill box comprising a plurality of gill bars and working and return spindles for effecting the working and return strokes of said gill bars, the combination of: a plurality of tiltably supported two-arm abutment levers respectively having a shorter and a longer arm with the longer arm arranged adjacent the respective end of the respective adjacent spindle for limiting the working and return strokes of said gill bars, a plurality of adjustable sleeve means respectively supported by the shorter arms of said levers, a plurality of coil spring means, one end of said spring means respectively engaging said adjustable sleeve means, fixed abutment means respectively engaged by the respective other end of said spring means, said sleeve means respectively being provided with indicating means for indicating the adjusted position thereof, and a plurality of screw means concentrically arranged with regard to said sleeve means and adjustable independently of each other for limiting the maximum tilting movement of said longer arm of the levers away from the respective adjacent spindle ends.

7. A gill box comprising a head and a plurality of gill bars and working and return spindles for effecting the working and return strokes of said gill bars, the combination of: transverse hollow rail means connected to said head, pivot means supported by said rail means, a plurality of two-arm abutment lever means respectively pivotally supported by said pivot means, one of the arms of each of said lever means extending through said rail means into the proximity of the respective end of one of said spindles, the other arm of each of said lever means being entirely located within said rail means, a plurality of pressure spring means arranged in said rail means and respectively having one end in engagement with said rail means and having its other end arranged for continuously urging the one arm of the respective lever means into engagement with the end of one of said spindles, and a plurality of adjustable rigid abutment means respectively associated with said lever means and adjustable independently of each other for individually limiting the maximum tilting movement of the respective lever means away from the adjacent spindle ends.

8. An arrangement according to claim 7, in which said rail means is provided with a lid normally closing said rail means, said lid being adapted selectively to be lifted up for permitting access to the interior of said rail means.

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