

Oct. 15, 1946.

W. HOLDSWORTH

2,409,565

GILL BAR OR FALLER FOR GILL DRAWING MACHINES

Filed July 24, 1943

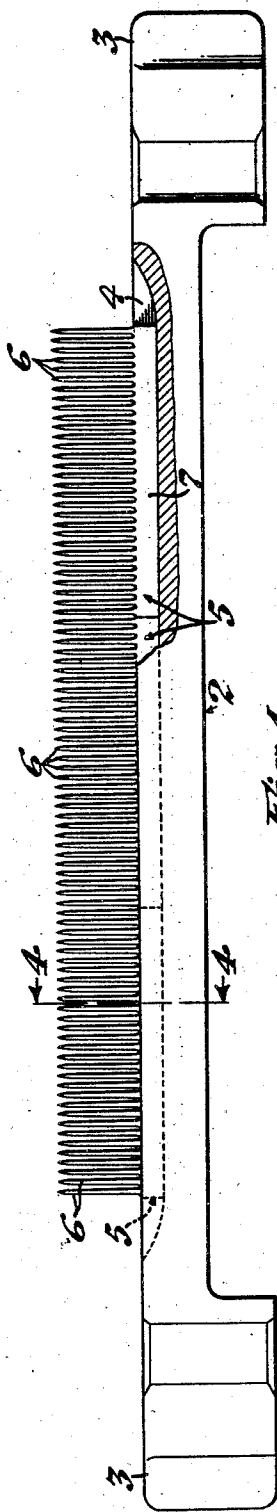


Fig. 1.

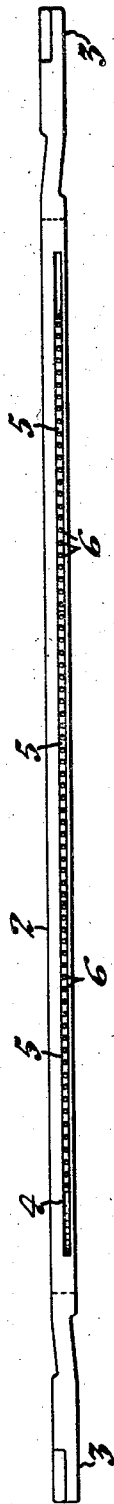


Fig. 2.

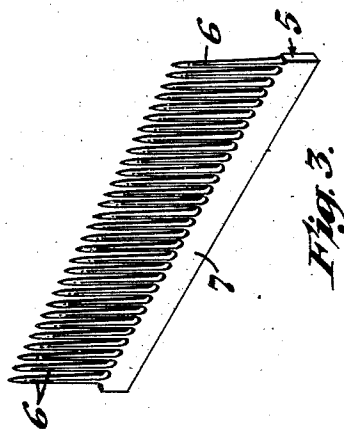


Fig. 3.

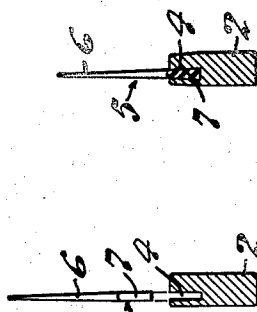


Fig. 4.



Fig. 5.

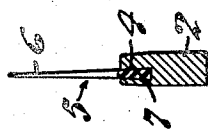


Fig. 6.

Inventor:
Willie Holdsworth
By
P. H. H. and White
Attorneys.

UNITED STATES PATENT OFFICE

2,409,565

GILL BAR OR FALLER FOR GILL-DRAWING
MACHINES

Willie Holdsworth, Seekonk, Mass.

Application July 24, 1943, Serial No. 496,029

3 Claims. (Cl. 19—129)

1

This invention relates to gill-drawing frames or gill-boxes and like machines and consists in improvements in the toothed gill-bars or fallers used in such machines.

One object of the invention is to provide a gill-bar in which the teeth or pins are inserted without drilling the bar with multiple holes whereof to obviate hand-operations by skilled mechanics and reduce the cost of manufacture.

Another object is to provide a gill-bar having insertable toothed sections or units which may be removed and replaced by units having teeth of different size or shape and of greater or lesser number.

Another object is to provide a gill-bar having relatively short sections or unitary groups of teeth or pins inserted therein which are removable for replacement of broken teeth without expensive machining operations.

Another object is to provide a gill-bar having toothed sections molded or cast from synthetic plastics or like materials.

Another object is to provide a gill-bar from which the teeth or pins can be salvaged should the bar become badly worn or broken.

Another object is to provide a gill-bar of the type specified which is stronger and less liable to damage or breakage while at the same time being considerably more economical to manufacture.

Further objects of the invention are set forth in the following specification which describes a preferred form of construction of the improved gill-bar, and also a modification thereof, by way of example, as illustrated by the accompanying drawing. In the drawing:

Fig. 1 is a longitudinal view of a gill-bar incorporating the present invention and showing a portion of the bar in fragmentary section to illustrate the manner in which the toothed units are inserted therein;

Fig. 2 is a top plan view of the bar;

Fig. 3 is a perspective view of one of the toothed sections or insertable units for the bar;

Fig. 4 is a transverse sectional view taken on line 4—4 of Fig. 1;

Fig. 5 is a similar view showing the toothed section or replaceable unit as disassembled from the bar; and

Fig. 6 is a view showing a modified form of the bar in which the toothed sections are adapted to be dove-tailed into a slot provided in the upper edge of the bar.

As well known to those versed in the art, gill-drawing frames or gill-boxes used for processing

2

textile fibers are provided with sets of top and bottom gill-screws for traversing the gill-bars or fallers to draw their pins or teeth through the material feeding through the machine. Heretofore, it has been the invariable practice to set the teeth or pins in the bars by drilling the bars with closely-spaced multiple holes and inserting the shanks of the pins thereinto. The fine holes for the pins must be very accurately spaced and it requires trained, skilled mechanics for performing this meticulous drilling operation. When a bar of the usual type becomes badly bent, broken, or worn it must be replaced in its entirety. Due to the shortage of skilled labor at the present time and the scarcity of critical material, such as steel, it is almost impossible to supply replacements for worn or broken bars and production on the machines is therefore curtailed. To overcome these defects and deficiencies in the type of bar now in general use I have provided a novel and ingenious form of construction of the bars as set forth in detail in the following description.

Referring to the present drawing, Figs. 1 and 2 illustrate a gill-bar or faller 2 constructed of steel with a relatively-narrow main longitudinal portion and wider ends 3—3 for engagement with the threads of the traversing screws in a gill-box. Extending longitudinally at the top of the main portion of the bar 2 I provide a relatively narrow slot 4 as shown most clearly in Fig. 5. The slot 4 may be cast in the bar, but preferably it is formed by a machining operation, for example, with a circular milling cutter. As shown in Fig. 1, a plurality of sections or units 5 formed with integral pins or teeth 6 projecting upwardly therefrom are inserted into the slot 4 to be fixedly held in place therein by any suitable means. Fig. 1 illustrates three of such units of equal length, but a greater or lesser number may be used in accordance with the required length of the toothed portion of the bar. For example, I may construct the sections of three different lengths: one of three inches, one of four inches, and another of five inches to provide for numerous different over-all lengths of the toothed portion of the bar by combining these sections in different arrangement. That is, I may use a single five-inch section for a five-inch over-all length of the toothed portion of the bar; two three-inch sections for a six-inch toothed length; a four-inch and a three-inch section for a seven-inch toothed length; two four-inch sections for an eight-inch toothed length; a five-inch and four-inch section for a nine-inch toothed length;

3

three four-inch sections for a twelve-inch toothed length; and three five-inch sections for a toothed length of fifteen inches. In this way various combinations may be arranged for bars of different lengths and the teeth or pins may be spaced with different pitches in different units; for example, in the usual practice the teeth are sometimes spaced eight per inch, ten per inch, and so on in accordance with the different types of pins used for different classes of work.

Each toothed section or unit 5 is constructed with a basal strip 7 of suitable depth and width or thickness to correspond with the dimensions of the slot 4 in the top of the bar 2. I may construct the toothed sections of steel, brass or other metal, but preferably, to avoid the use of critical materials and to economize in the cost of manufacture, I propose to make the sections of synthetic plastics, cast or molded by well-known processes. Any suitable phenolic-condensation product, such as that known by the trade name "Bakelite," may be used as the material for producing the toothed unit and a large number of other synthetic resinoids are available and suitable for the same purpose. Preferably, I use thermosetting plastics such as phenol-formaldehyde; phenol-furfural; or urea-formaldehyde, which are cured under heat to render the parts of the unit hard and relatively non-resilient and give it strength, rigidity and resistance to wear. The units may be either cast in suitable dies or formed in molds under heat and pressure and the resultant structure is as strong and durable as a unit constructed from metal with the cost materially lower.

The units 5 are inserted into the groove 4 in the top of the bar 2 in the manner illustrated in Figs. 1 and 4, and the portions of the bar at the sides of the groove may be compressed or bent one toward the other to pinch against the basal portion 7 of each unit to clamp the units in place with their ends abutting, thereby effecting a firm connection of the units with the bar. In some cases I may form the basal portion 7 of each unit with its sides tapering toward the top and by bending or compressing the sides of the bar 2 along its upper edges a dove-tailed fit may be secured as shown in Fig. 6.

It has been stated that any suitable number of toothed units 5 may be provided in accordance with the number, size and pitch of the teeth required for certain classes of work, and when the units are firmly clamped within the groove 4 of the bar 2 the pins or teeth 6 will project thereabove in proper arrangement for processing the fibers through which they are drawn. By casting or molding the units 5 in dies, very accurate and uniform spacing of the teeth 6 may be secured and the integral teeth or pins are rendered as strong and resistant to wear as the steel pins now generally used. While I have stated that thermosetting plastics are used preferably for the material of the units they may also be made from thermoplastics of such nature as to render their teeth somewhat resilient, thereby tending to permit them to yield slightly to resist fracture upon encountering irregularities in the material being worked.

It also has been determined that the toothed units may be constructed from either natural or synthetic rubber cured to the proper degree to

4

give the necessary hardness and durability to the pins, and other materials besides those specifically mentioned herein, may be employed within the scope and purview of the present invention.

It will be observed from the foregoing specification that my invention provides a particularly strong and durable toothed gill-bar or faller which possesses all the attributes of a bar having steel pins or teeth while avoiding the meticulous and laborious manual operation of drilling the bar with accurately-spaced fine holes for receiving the shanks of the pins.

Moreover, by constructing the toothed portions of the bar in sections or units, in case of breakage or damage to the teeth one or more of the units may be removed and replaced with another of proper size without forcing out the pins and driving new ones into the holes as with the usual type of bar. Furthermore, if a bar becomes broken or damaged in use the toothed units or certain of them, may be salvaged for use with a new bar, damage and wear usually taking place at the ends of the bar so that the teeth are not ordinarily affected.

While I have herein illustrated and described a preferred form of construction of the improved gill-bar or faller, it is to be understood that various modifications may be made in the structure and arrangement of its parts without departing from the spirit or scope of the invention. For example, my invention may be adapted for use in circular combs for use in "Noble" combing machines. Therefore, without limiting myself to the precise construction herein shown and described, I claim:

1. A faller for gill-boxes and like machines comprising a metal bar having a relatively narrow slot at its top, and toothed units formed with strip-like basal portions of tapering cross-section inserted in the slot in the bar with the sides of the slot bent or formed to engage the sides of the tapered basal portions of the units in dove-tailed relationship to fasten them in place on the bar.

2. A faller for gill-boxes and the like comprising a metal bar having its ends adapted for engagement with the traversing screws of the gill-box, a plurality of toothed units each constructed of plastic material such as a resin or resin derivative molded to form a longitudinally-extending strip-like basal portion with upstanding teeth molded from the same plastic material as said basal portion in one piece therewith, and means integral with the metal bar for fastening several units in abutting relationship along the top of the bar with their teeth projecting thereabove.

3. A faller for gill-boxes and the like comprising a metal bar having its ends formed for engagement with the threads of the traversing gill-screws and provided with a slot extending along its top, a toothed unit molded from plastic such as a resin or resin derivative with a longitudinally-extending basal portion shaped to engage the slot in the top of the bar and teeth molded from the same plastic material as the basal portion to form them integral therewith projecting in upright position thereabove, and means integral with the metal bar for fastening the basal portion of the unit in the slot in the bar.

WILLIE HOLDSWORTH.