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FALLER BAR AND METHOD OF MAKING SAME

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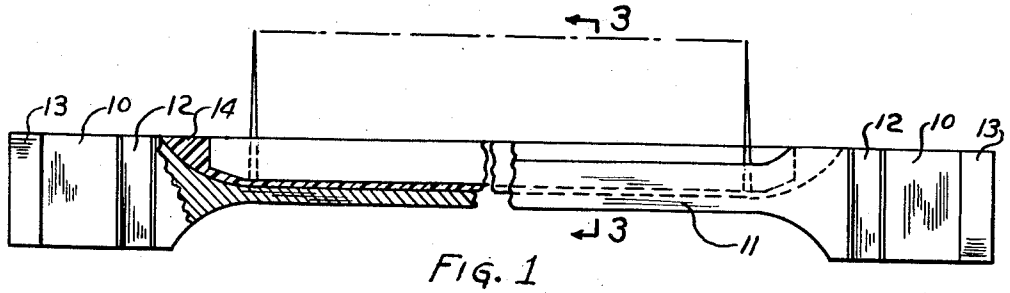


FIG. 1

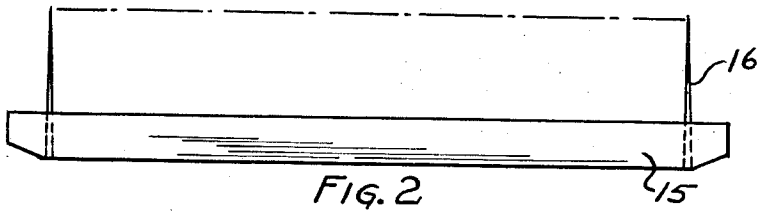


FIG. 2

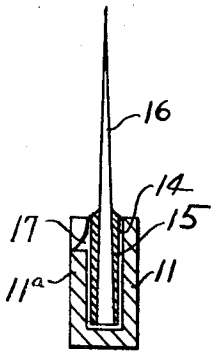


FIG. 3

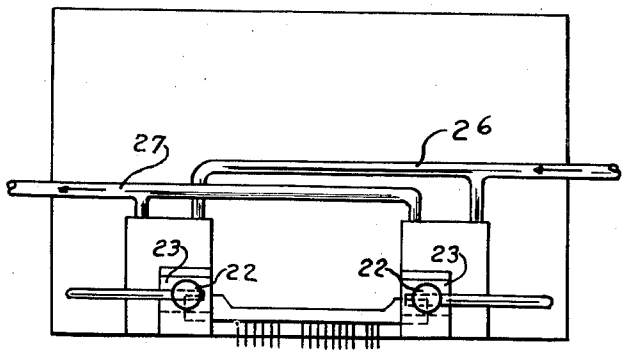


FIG. 4

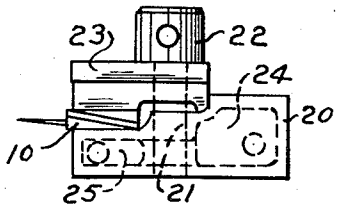


FIG. 6

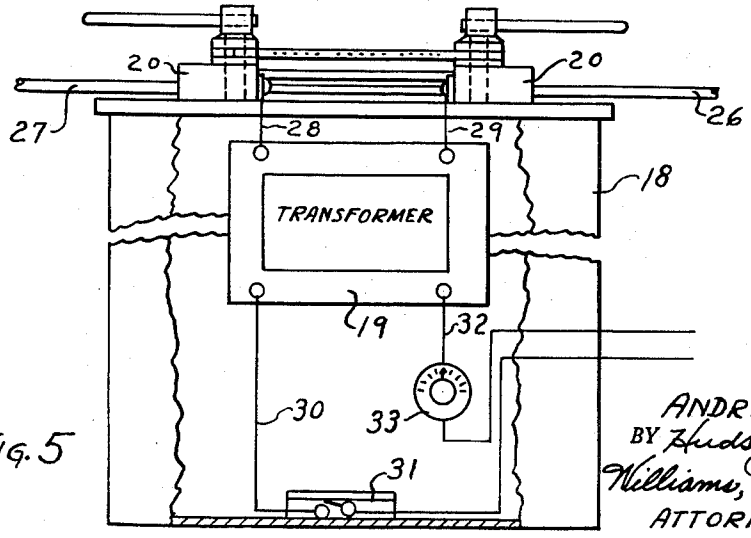


FIG. 5

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FALLER BAR AND METHOD OF MAKING SAME

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Application December 15, 1954, Serial No. 475,425

3 Claims. (Cl. 19—129)

This invention relates to a new and improved faller bar and the method of making the same.

Faller bars are utilized in gill boxes for combing fiber staples into parallel relationship in slivers in the production of thread or yarn for making textiles.

An object of the invention is to provide a new and improved faller bar which is so constructed that the longitudinal series of pins mounted and secured therein are effectively anchored in proper spaced relationship to each other and to the faller bar proper.

Another object is to provide a faller bar wherein the butt ends of the series of spaced pins are molded and anchored in a plastic base in proper spaced relationship and said base with the pin butts anchored therein constitutes an insert unit which is securely cemented in position in the groove of the body of the faller bar, but which insert unit, if the pins thereof are damaged, can be readily removed from the groove of the body of the faller bar to prepare the latter to receive an undamaged similar insert unit.

Another object is to provide a faller bar such as referred to in the first named object and wherein the material of the base of the pin strip insert unit and the cement employed to secure the base in the groove of the faller bar body are of such character that should any of the pins of the unit become damaged in use the insert unit can be readily removed from the groove and thus the body will be conditioned to receive and have cemented therein the base of a new and undamaged pin strip insert unit.

Another object is to provide a faller bar wherein the butt ends of the series of spaced pins are anchored in a plastic base strip to provide a pin strip insert unit which, in turn, is secured in the groove of the faller bar body with the material of the base of the unit providing a measure of flexibility that reduces the likelihood of the pins shearing during use and which absorbs the vibrations that tend to occur in faller bar and pins which tend to crystallize the pins and cause breakage thereof.

Another object is to provide a faller bar which is so constructed that its useful life under normal operating conditions is greatly prolonged.

Although normal use of the faller bar embodying the invention would not cause breakage of the pins, there are conditions arising in use such as knots in the fibers or matted fibers, that sometimes cause breakage of a pin or pins of the faller bars as the same are moved positively through the fibers during the operation of the gill box. When such condition occurs the faller bar embodying the present invention has the advantage that the pin strip insert unit composed of the old series of pins and the base in which the butts thereof are embedded can be readily removed from the groove of the faller bar body for the insertion and securing therein of a new undamaged pin strip insert unit.

Further and additional objects and advantages not hereinbefore referred to will become apparent hereinafter during the detailed description of the invention which is to

follow and which description will be with reference to the accompanying drawing forming part of this specification and wherein:

Fig. 1 is a front view of a faller bar embodying the invention and is mostly in elevation but with certain portions broken away and shown in section.

Fig. 2 is a front elevational view illustrating the pin strip insert unit having the longitudinal series of spaced parallel pins, the butt ends of which are anchored in a plastic base and which base is inserted in the groove of the faller bar body and cemented therein.

Fig. 3 is a transverse sectional view taken substantially on line 3—3 of Fig. 1 looking in the direction of the arrows and which shows the completed faller bar having the pin strip insert unit cemented in the groove of the body.

Fig. 4 is a top plan view of an apparatus for applying heat to the intermediate non-hardened portion of the faller bar body while at the same time maintaining a low pressure in the hardened end portions thereof and which apparatus can be employed to carry out the method of removing the pins and base of the insert unit from the groove of the faller bar body, a defective faller bar being illustrated as mounted in said apparatus preparatory to removing the insert unit from the groove of the body.

Fig. 5 is a front elevational view of the apparatus shown in Fig. 4, and

Fig. 6 is a detached view of one of the clamping devices of the apparatus that are used to clamp the hardened end portions of the faller bar body and to maintain such end portions at a low temperature.

Referring first to Figs. 1 to 3 inclusive, the faller bar comprises a body machined from steel or other suitable material and having hardened end portions **10** and a non-hardened intermediate portion **11** extending between said end portions. The end portions **10** are provided with guide grooves **12** and at their ends with screw thread engaging lips **13**. It will be understood that the guide grooves **12** cooperate with elements of the gill box in which the faller bar is used and function to guide the faller bar in its movement in the gill box while the thread engaging lips **13** engage the threads of actuating screws in the gill box to provide linear combing and return movements of the faller bar therein.

The intermediate portion **11** of the body is provided with a longitudinally extending proove **14**, one of the walls of said groove being of less height than the other wall thereof as, for instance, the wall **11*a*** as shown in Fig. 3. The body of the faller bar as thus far described is conventional.

It is contemplated to mount in the groove **14** the molded plastic base **15** of a pin strip insert unit and in which base **15** the butts of the pins of the longitudinal series of spaced parallel pins **16** are embedded and anchored. The pin strip insert unit composed of the base **15** and pins **16** may be constructed in accordance with the disclosure in my copending application Serial No. 475,363, filed December 15, 1954, and may be produced by the apparatus disclosed therein.

The base **15** of the pin strip insert comprises two longitudinally extending strips of thermosetting plastic arranged on opposite sides of the butts of the pins **16** and extending beyond each of the end pins of the series of pins. Also the base includes short U-shaped strips of thermosetting plastic embracing the ends of the long strips of plastic. The long strips of plastic and the U-shaped strips thereof are molded under heat and pressure to thoroughly embed the pin butts therein and to adhere to the same and are then set to form the base **15**, all as disclosed in my said copending application.

Preferably prior to the application of the plastic strips to the pin butts the latter have a thin coating of bonding

material brushed or otherwise applied thereto as, for instance, a hycar resin solution and such material likewise is applied preferably to the sides of the plastic strips which initially contact the pin butts prior to the application of the strips to the pin butts.

The groove **14** in the faller bar body prior to the insertion therein of the base **15** of the insert unit is filled with a cementitious material which will set by exposure to air at room temperature or more quickly by subjecting it to moderate temperature in an oven and which when set does not shrink or become brittle. This material when set securely anchors the base and the pin butts in the groove and is displaced by the insertion of the base **15** into the groove so that it flows over the top of the base and around the pins and builds up a bead **17** on top of the short side wall **11***a* of the groove. In addition, the cementitious material completely fills the groove beyond the opposite ends of the base **15** of the insert unit and said material acts to hermetically seal the groove and the base therein. The cementitious material in addition to being non-shrinking when set also has the property of generating gas when subjected to high heat and this same characteristic obtains with respect to the bonding material above referred to and which was placed on the pin butts and on the sides of the plastic strips contacting the pin butts.

The cementitious material is a commercially available non-shrinking type, the presently preferred cement being "Nureco" number G. R. 134 purchased from Nureco, Inc., Cranston, R. I., modified for this particular purpose and identified as W. & S. 134.

It will be noted that a faller bar constructed as shown in Figs. 1 to 3 inclusive and described above has the decided advantage that the pin butts are embedded in a base formed of a material having a measure of resiliency and this increases the useful life of the faller bar. This is brought about since should the pins strike minute obstacles during the combing movement of the faller bar the resiliency of the base will allow slight absorbing movements of the pins to minimize bending of pins or the creation of vibrations therein which might crystallize the same and cause them to shear or break.

It sometimes occurs that the fiber slivers being combed by the faller bar are unusually twisted, bunched or matted together or have knots therein and this extreme condition might cause breakage of one or more pins during the positive combing movement of the faller bar through the fibers. The faller bar constructed as above described has the advantage that should one or more of the pins thereof be broken the insert unit can be readily removed from the groove of the faller bar body and a new pin insert unit mounted and secured in the groove thereof. This removal of the pin insert unit from the groove of the faller bar can be readily accomplished by subjecting the intermediate non-hardened portion of the faller bar to heat at a temperature above the setting temperature of the cementitious material and then increasing said heat in excess of the maximum temperature at which the plastic base **15** was cured.

The subjection of the intermediate portion **11** of the faller bar to the heat as just referred to causes the cementitious material and the bonding solution which had been applied to the pin butts and to the sides of the plastic strips prior to molding to generate gas in the groove **14** productive of a pressure to expel the base **15** from the groove either as a unit or in fragments. Then the continued application of heat at increased temperatures will cause any residual cementitious material or plastic material of the base to carbonize into an ash so that it can be readily scraped or otherwise removed from the groove.

In applying the heat to the intermediate portion **11** of the faller bar which is non-hardened the temperature of the hardened end portions **10** must be maintained relatively low so as not to draw off the hardness thereof. It has been found that the heating of the intermediate non-hardened portion **11** and the simultaneous maintenance of the end portions **10** at a relatively low temperature can be effectively carried out by passing through the faller bar an electric current to produce therein the required heat by resistance and at the same time to circulate water or coolant in close proximity to the end portions **10** of the faller bar body.

A suitable apparatus for effecting this operation is shown in Figs. 4 to 6 inclusive and may comprise a cabinet **18** housing a suitable transformer **19** and provided on its table-like top with spaced clamp blocks **20** on which the end portions **10** of a faller bar body can be positioned, as shown particularly in Fig. 6.

The blocks **20** mount clamping screws **21** which are provided at their upper ends with capstan heads **22**. Clamp jaws **23** are carried by the clamping screws **21** intermediate the capstan heads **22** and the clamp blocks **20** and it will readily be seen that the screws **21** can be backed off and the clamps **23** swung to a position wherein the end portions **10** of the faller bar can be positioned on the blocks **20** and then said clamps can be swung back to engage said end portions, after which the screws **21** can be screwed down to cause the clamps **23** to firmly clamp the end portions **10** against the blocks **20**.

The clamp blocks **20** are provided with passages **24** and **25** which are connected, respectively, to the supply conduit **26** and the exhaust conduit **27** of a water or coolant circulating system. The terminals on the output side of the transformer **19** are indicated at **28** and **29** and are connected to the clamp blocks **20**. The terminals on the input side of the transformer **19** are connected to an input supply electrical line **30** in which is a suitable switch **31** such as the normally open foot-actuated switch shown in Fig. 5 and to a line **32** in which is a timing control clock and switch unit **33**.

It will be understood that when the faller bar that is to have the pin strip insert unit removed therefrom is clamped against the blocks **20** and water or coolant is circulating through the passages **24** and **25** of the blocks the operator closes the switch **31**. It may be assumed that the timing control clock **33** has been set for the maximum time period required so that upon the closing of the switch **31** the circuit from the secondary of the transformer is through the blocks **20** and the steel body of the faller bar and particularly through the non-hardened intermediate portion **11**. This causes resistance heating of the faller bar body particularly the intermediate portion **11** thereof while the water or coolant flowing through the blocks **20** maintains the hardened end portions **10** at a relatively low temperature. The heat in the intermediate portion **11** gasifies the cementitious material and the bonding material and this produces a pressure which in some instances ejects the base **15** and pins **16** of the insert unit bodily as a unit out of the groove of the faller bar while in other instances the base **10** may be ejected in fragments. There may be a residue of cementitious material or of the plastic material of the base **15** of the insert unit left in the groove **14** of the faller bar and in order to properly remove this the heat is maintained in the intermediate portion **11** and increased to a point wherein such residual material carbonizes into an ash which can be readily scraped or otherwise removed from the groove to prepare the faller bar body for the securing of a new undamaged pin strip insert unit in the groove thereof.

Although preferred embodiments of the invention have been disclosed herein it will be understood the invention is susceptible of various modifications and adaptations within the scope of the appended claims.

Having thus described my invention, I claim:

1. A faller bar comprising a metal body provided with hardened end portions with an intermediate portion therebetween having therein a longitudinally extending

groove, a molded plastic base of a pin strip insert unit in which the butts of the pins are embedded positioned in said groove so as to substantially fill the same, and a hardened non-shrinking cementitious material filling said groove and the interstices between the base and the walls of the groove and extending across the top of the base and securing said base in said groove and hermetically sealing the same therein.

2. A faller bar as defined in claim 1 and wherein one of the side walls of said groove is of less height than the other side wall thereof, while said cementitious material forms a bead engaging said base of the insert unit and contacting the upper end of the shorter wall of said groove.

3. The method of making a fiber combing device which is provided with a groove for mounting therein the butts of a series of spaced parallel pins which comprises filling the groove of the device with a non-shrinking cementitious material while in a flowable or viscous condition, then mounting in said groove the molded plastic base of a pin strip insert unit and in which base the butts of

the pins are embedded centrally thereof so that the cementitious material fills the interstices between the base and the walls of the groove with the cementitious material that is displaced by the base extending over the top of the base and the top of the walls of said groove, and then hardening said cementitious material to secure the base in the groove and to hermetically seal the same therein.

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