June 18, 1935. G. GASTRICH 2,005,674

MOUNTING MEANS FOR NEEDLES AND THE LIKE

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FIG. 1.

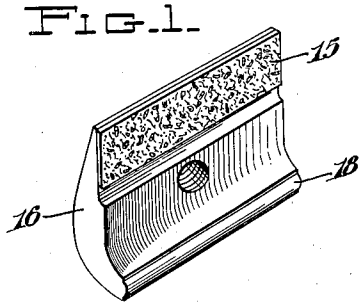


FIG. 4.

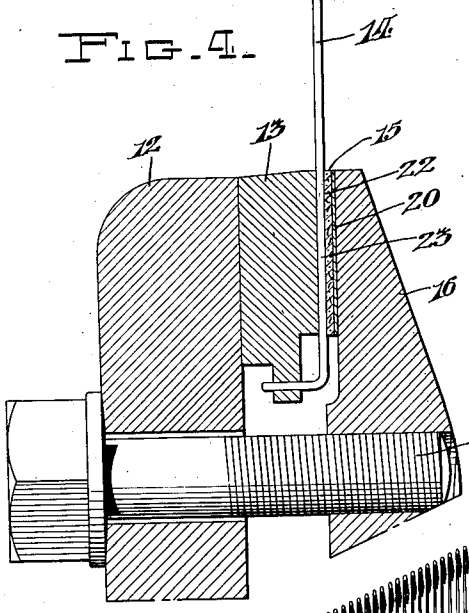
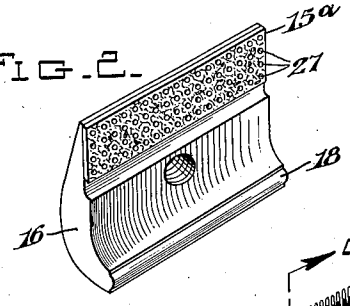


FIG. 2.



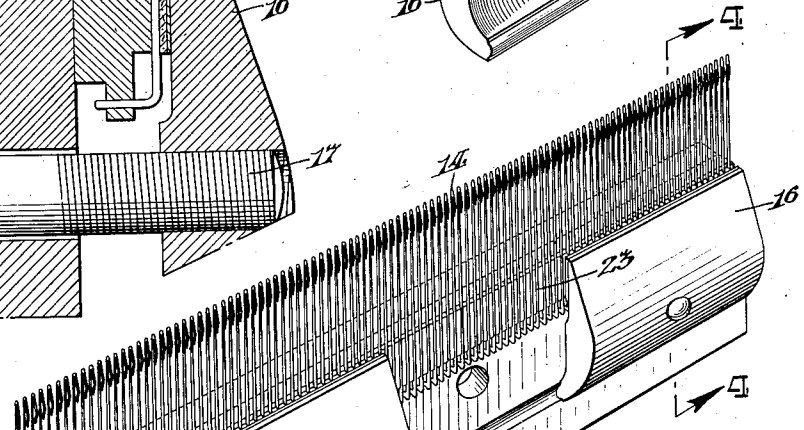


FIG. 3.

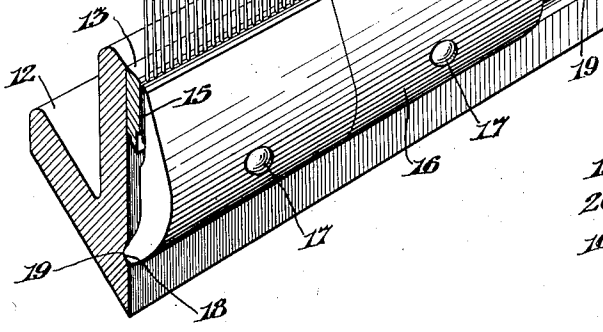
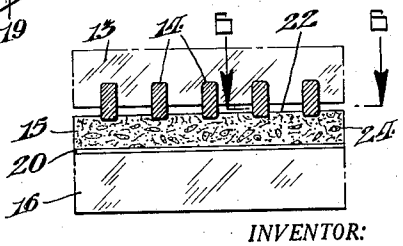


FIG. 5.



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FIG. 6.

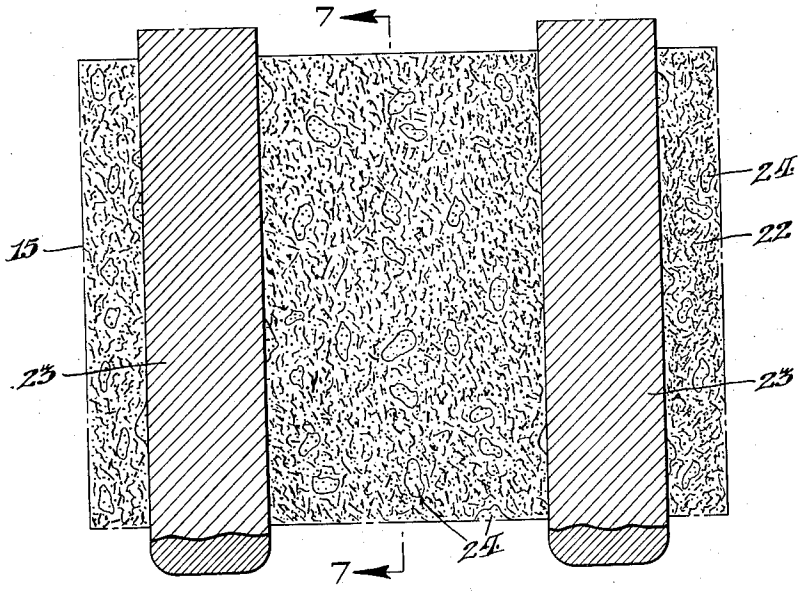


FIG. 7.

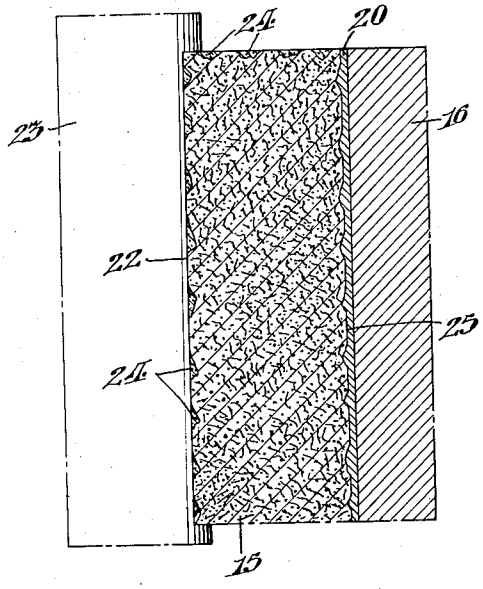
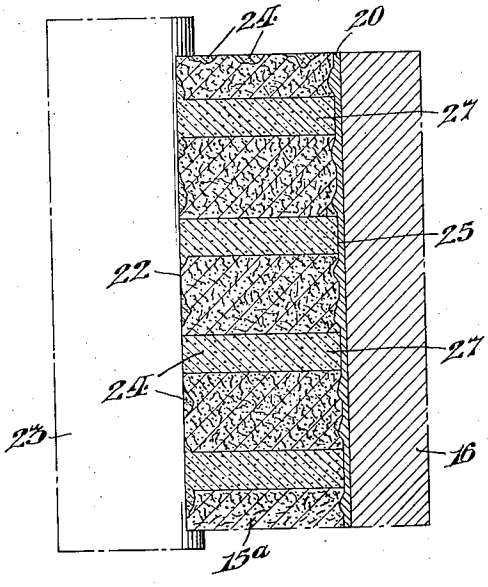


FIG. 8.



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Patented June 18, 1935

2,005,674

UNITED STATES PATENT OFFICE

2,005,674

MOUNTING MEANS FOR NEEDLES AND THE LIKE

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Application July 31, 1934, Serial No. 737,741

7 Claims. (Cl. 66—114)

My invention relates to devices for supporting machine elements, such as the needles of knitting machines, and particularly to means for preventing deterioration of the elements and the support, as from rust.

In clamping devices where machine elements, such as the spring beard needles of a flat knitting machine, are operatively held between clamping jaws, such as the needle bars, strips of yieldable material are ordinarily provided between the needles and the clamping portions of the bars to evenly distribute the clamping pressure.

The yieldable pad or strip elements are usually of a fibrous or porous composition, and altho equalizing the pressure of the clamping jaws, they also absorb moisture, as from the liquids used for yarn conditioning and cleaning purposes, thereby dampening the needles and inducing the rusting thereof. Altho the moisture and rust may readily be removed from the exposed portions of the needles, such procedure is impracticable as to the portions of the needles within the needle bar, unless the clamping members are removed. This procedure requires shutting down the machine and entails considerable loss of time in production. The moisture between the clamping jaws of a needle bar also causes deterioration of the pads and gradually dissolves the rust preventing coating on the needles, thereby hastening and sustaining the rusting action, which reduces the strength and decreases the life of the needles. Also, where a needle is replaced, the new needle is positioned on the defective pad, which may retain rust particles from the old needle.

It is therefore, among the objects of the invention to avoid the above-mentioned detrimental effects, by preventing the rusting of the needles at the position of attachment thereof in the needle bar; to keep the mechanism cleaner; to increase the life of the needles; to reduce the time of shutdown of the machines; to avoid deterioration of the pads; and to obtain the other advantages incident to utilization of the improvement, as in cleaning, wherein the cleaning fluids may be used more freely about the parts, thereby to obtain better results without the necessity for undue care in attempting to keep the fluids away from the parts.

Another object of the invention is to provide substantially a reservoir for a reserve supply of a substance capable of flowing, such that parts which are not in direct contact with the main supply body receive the substance by a surface-creepage or capillary action, as augmented by the assembly clamping action, by the vibration of the needles and perhaps by slight temperature changes from time to time.

Another object is to provide a novel needle bar structure for a straight knitting machine to constitute combined means for effectively performing its usual function and protecting the parts as above set forth.

Further objects are to provide a device of the above-indicated character that is simple and durable in construction, economical to manufacture, effective, and capable of employment with existing knitting machines.

With these and other objects in view, which will become apparent from the following detailed description of the illustrative embodiment of the invention shown in the accompanying drawings, my invention resides in the novel elements, features of construction and arrangement of parts in cooperative relationship, as hereinafter more particularly pointed out in the claims.

In the drawings:

Figure 1 is a perspective view of a needle bar clamp embodying the invention,

Fig. 2 is a view, similar to Fig. 1, of a modified form of the invention,

Fig. 3 is a fragmentary perspective view of a needle bar structure of a full fashioned knitting machine, showing several of the clamps of Fig. 1 in position,

Fig. 4 is an enlarged partial sectional view taken substantially along the line 4—4, Fig. 3,

Fig. 5 is an enlarged top plan view of a portion of the device of Fig. 3, showing the needles in section,

Fig. 6 is a greatly magnified sectional view taken substantially along the line 6—6 of Fig. 5,

Fig. 7 is a view taken substantially along the line 7—7, of Fig. 6, and

Fig. 8 is a view, similar to Fig. 7, of a form of the invention indicated in Fig. 2.

In a preferred form, given only as an example in connection with the loop-forming needles and not intended as limiting the invention as to equivalent structure for obtaining like results, since it may likewise be applied to other needle-like elements of the machine, such as the welt hooks, the transfer and topping points, and the springs and combs of the jack-bed assembly, an absorbent body, such as a strip of relatively hard fiber board or the like, is impregnated with a flowable substance which is non-miscible with hydrous liquids. This absorbent body, which is also of such character as to constitute a yielding pad between the needles and the needle-bar

clamping parts, is secured to one of such parts, preferably by a hardening adhesive liquid, with a needle-clamping face of the pad saturated with the rust-proofing substance. When clamped against the needles, the parts thereof directly engaged by the body are immediately protected, and the parts of the needles not directly engaged by the body are, by surface attraction for the protective fluid, as affected by pressure, vibration and temperature change, above mentioned, supplied with the fluid. The body and the impregnating material are chosen and arranged such that the body constitutes substantially a reservoir whereupon, after the initial contact of the pad with the needles, altho the fluid will not leak wastefully, or bleed, from the pad, a continuing supply of the protective fluid is maintained, which will feed to the needles.

The usual needle bar assembly, of a straight or full fashioned knitting machine, comprises a bar 12, and a slotted bed 13, to which the needles 14 are clamped by yielding strips or pads 15 carried by jaws 16, which are adjustably secured to the bar 12, as by bolts 17. Alignment of the jaws 16 relative to each other is ordinarily effected by engagement of the rounded portion 18, with a longitudinally extending groove 19 formed in the bar 12. The strip 15 is preferably secured to the clamp 16 by a layer of adhesive substance 20, such as shellac or other suitable material, and provides a yielding contact surface 22 for clamping the needles 14 to the bed 13 to evenly distribute the pressure of the clamping members 16 over the needles 14. The clamp 16 rigidly maintains the stems 23 of said needles in a definite spaced relation to each other.

In accordance with the invention, in order to prevent the absorption of moisture by the strip elements 15, and to prevent the formation of rust on the clamped portions of the needles, the strip 15 is constituted as a saturated pad or reservoir of moisture repellent material. To form the reservoir, the strip 15 is impregnated, preferably after it has been secured to the clamp, with a suitable substance 24, Figs. 5, 6 and 7, such as petrolatum or other oily or unctuous substance which, although being non-miscible with water, may be applied to the pores of the strip 15 to form a reservoir of moisture repellent material within the structure of the strip; a preferred method, as hereinafter more particularly pointed out, being to heat or otherwise liquefy the petrolatum or other substance, apply it to the pad in liquid state, and allow the structure to cool or harden.

By this selection of materials and method of treating and assembly, a reservoir pad is provided which does not, as it would if treated with ordinary or highly volatile oils, lose its effectiveness over long periods of time, since light oils evaporate quickly and do not have sufficient body, whereas petrolatum, or other similar substance of relatively high viscosity, endures, not only to protect the needles, but to preserve the pad, and to provide a greater reserve supply.

Thus, altho the strip 15 does not completely surround the stem portions of the needles held within the clamping zone of the needle bar, the moisture repellant substance carried by the strip will slowly creep or flow therefrom and maintain a protective film on the needles. This film, or coating, is thus constantly replenished and acts to prevent rust-forming liquids from penetrating the pad, and even though portions of the protective coating on the needles should be subjected, at remote intervals, to rust-forming influences, the reservoir of moisture-repellent material contained within the strip automatically replenishes the protective coating.

Figs. 6 and 7 are greatly exaggerated views showing that the pores of all exposed surfaces of the strip 15 are filled with the lubricant or moisture-repellant substance 24, which is fed to the stems of the needles to maintain a protective coating thereon. The irregularities of the surface 25 next to the clamping jaw 16 are filled with a suitable adhesive substance by which the strip is attached to the jaw.

The needle engaging surface 22 of the strip 15, although ordinarily having many microscopic cavities in its untreated form, is according to the invention, normally smooth and regular, see Figs. 1 and 6, since the irregularities of the exposed surfaces are filled with the rust-proofing substance.

Impregnating the strip elements 15 with a rust-preventing compound may be effected by absorption or by forcing the compound into the pores of the strip under pressure; a preferred method being to first apply a film of shellac, or material on the order of shellac as to its resistance to oil and its ability to adhere to both metal and fibre, to that surface 25 adjoining the clamping jaw. This material penetrates the pores and fibres of the strip and, when hardened, provides a firm anchorage therefor. Next, the assembled jaw and strip may be heated, and petrolatum or a like oleaginous substance heated to a free flowing state and applied thereto. One method of applying the substance is to work it into the strip with a soldering iron; and another method to heat both the substance and the strip, and apply the substance to the strip under a vacuum, the latter procedure drawing out of the strip substantially all trapped air and ensuring substantially maximum penetration of the petrolatum.

In the modification shown in Figs. 2 and 8, the strip 15*a* is provided with a relatively large number of cells or apertures, as the symmetrically distributed cells 27, on the order of pin holes or slightly larger, such as not to materially change the clamping resistance or yield of the strip as a clamp cushion, but to increase the total capacity of the strip for the moisture-repellent material thereby to make the moisture-repellent qualities thereof to last longer before renewal of the strips is necessary. To obtain such result, it is necessary that the substance should not bleed or escape by unnecessary leakage, but should be capable of feeding to the needles as required; the density of the strip, the viscosity of the substance and other factors being correlated to the above ends in the structure of the invention.

Of course, the improvements specifically shown and described, by which I obtain the above results, can be changed and modified in various ways without departing from the invention herein disclosed and hereinafter claimed.

I claim:

1. A knitting machine comprising a bed element having elongated seats, needle-like members having longitudinal stem sections along said seats and working portions projecting therefrom, clamping means including a jaw element opposite said jaw between the bed and said needle-like members, and means for distributing clamping pressure over the stems, preventing the admission of moisture to certain parts in the clamping zone and compensating for its effects at other parts therein including an element operating as a cush-

ion between one of said elements and said needle-like members and containing a moisture-repellant substance prevented from bleeding from the cushion but operating to maintain the substance in contact with portions of the needle-like members under normal temperature conditions.

2. A knitting machine comprising a bed element having elongated seats, needle-like members having longitudinal stem sections along said seats and working portions projecting therefrom, clamping means including a jaw element opposite said jaw between the bed and said needle-like members, and means for distributing clamping pressure over the stems, preventing the admission of moisture to certain parts in the clamping zone and compensating for its effects at other parts therein including a yieldable strip between one of said elements and said needle-like members, said strip having cells of a size and distribution therein in accordance with the yieldability of the strip material to retain therein a predetermined resistance to the clamping force and to hold a predetermined supply of moisture-repellant substance prevented from bleeding from the strip but operating to supply the substance to portions of the needle-like members under normal temperature conditions.

3. In combination, in a knitting machine, a bank of needle-like elements, means for supporting the same including a backing portion extending over lengths of the stems thereof, and means including a yieldable pad providing a cushion for the needle-like elements and containing a substance protecting said elements against moisture between said backing portion and said stem lengths from which working portions of the elements project.

4. A knitting machine comprising a needle-bed having seats, needles having stems on said seats and working portions projecting therefrom, a clamp, and means for distributing clamp pressure on the stems, preventing the admission of moisture to certain parts and counteracting its effects at other parts of the stems in the clamping zone including a hard fibrous strip secured to the clamp by an oil-resistant cement and substantially saturated by an oleaginous material of viscosity preventing its bleeding but causing it to feed to the needles under ordinary temperatures.

5. The method of assembling a strip of hard fibrous material on a clamp jaw for position against a bank of needles of a straight knitting machine and treating said strip to protect the needles against moisture, which comprises first placing a film of oil-resistant adhesive on the order of shellac between the strip and the jaw to penetrate the strip, allowing the film to harden, heating the assembled strip and jaw, heating to a free-flowing state an oleaginous substance normally of relatively high viscosity, and applying the hot liquid to the heated strip whereby, when cooled, the strip holds substantially a maximum of the substance in a state preventing its bleeding from the strip but allowing it to feed to the needles.

6. The method of preparing a strip of hard fibrous material for assembly on a clamp jaw, assembling the strip on the jaw and treating the strip after assembly, for position against a bank of needles to protect the needles against moisture, which comprises, selecting the strip as to hardness such that, after perforating, it will have effective resistance to, and yield against, the service-clamping pressure, perforating it with cells of a size and symmetrical spacing to effect such resistance and yield and to hold a predetermined quantity of moisture repellant material, placing a film of oil-resistant adhesive on the order of shellac between the strip and the jaw to penetrate the strip, allowing the film to harden, heating the assembled strip and jaw, heating to a free-flowing state an oleaginous substance normally of relatively high viscosity, and subjecting the heated strip to a vacuum while applying the hot liquid to the heated strip whereby, when cooled, the strip holds, in its fibers and in its said cells, substantially a maximum amount of the substance in a state preventing its bleeding from the strip but allowing it to feed to the needles.

7. A support, for needle-like elements of a straight knitting machine, comprising a bed having parallel uniformly laterally spaced grooves in a surface of the bed for receiving said elements and means for holding the elements longitudinally, a set of needle-like elements to be held by the bed in said grooves laterally relative to each other with sides of the elements protruding from the grooves laterally to said bed surface, the elements also being adapted to be held longitudinally by said means, a jaw for clamping the elements against the bed having a surface for parallel relation to said bed surface facing said protruding element sides, means for clamping the jaw relative to the bed, a strip of hard fibrous material on said jaw surface for compression by the jaw against said protruding element sides, a film of oil-resistant adhesive on the order of shellac between the strip and the jaw adhering to the jaw and penetrating the strip, and an oleaginous substance normally of relatively high viscosity in said strip, said substance being capable of sufficient liquefaction under heat to penetrate said strip and remain in the strip to the maximum quantity of which the strip as so constituted is capable of holding under normal temperature conditions, and also, being capable of feeding to the elements, and prevented from bleeding from the strip, under such conditions.

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