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THREAD MOISTENING APPARATUS

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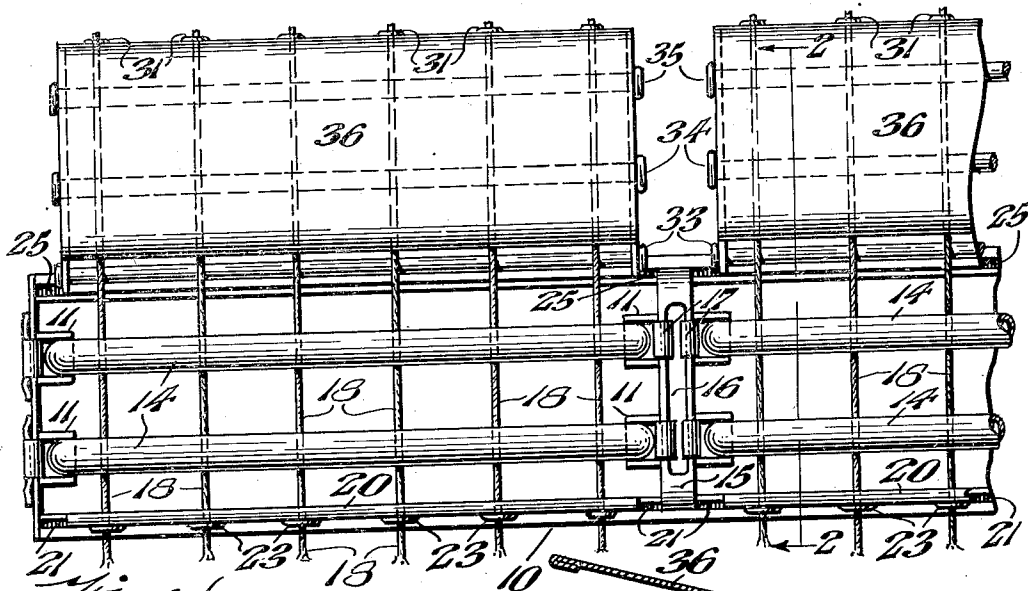


Fig. 1.

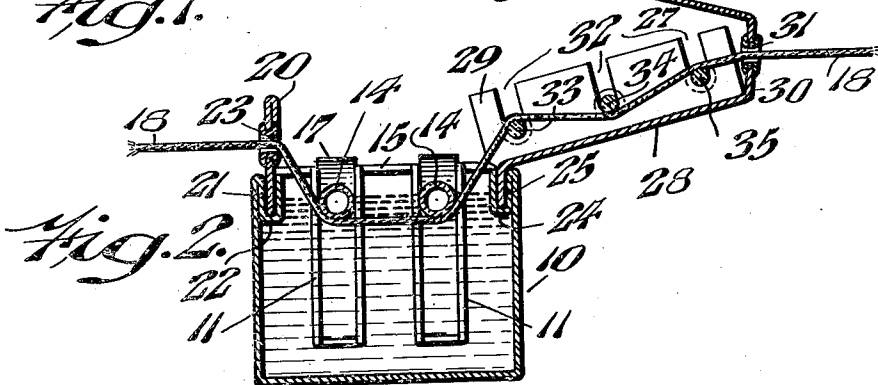
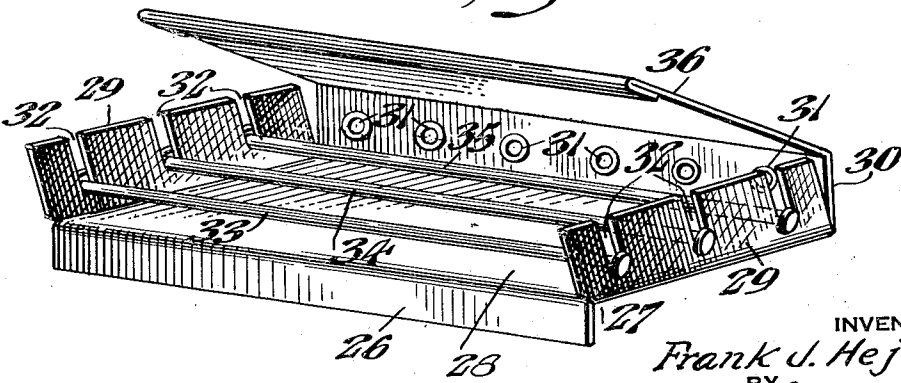


Fig. 2.

Fig. 3.



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THREAD MOISTENING APPARATUS

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7 Claims. (Cl. 91—32)

The present invention relates generally to moistening devices for thread and more particularly to such a device employed as an attachment for a knitting machine.

Some of the objects of the present invention are to provide an improved thread moistener; to provide a thread moistener which delivers the thread in a uniform moistened condition; to provide a thread moistener which automatically removes excess liquid from the thread after the moistening operation; to provide means in a thread moistener for smoothing the thread for delivery to a knitting machine so that it is of uniform gage and uniformly moistened; to provide a thread moistener wherein splashing of the liquid at the delivery end of the device is prevented; to provide a variable tension mechanism for thread moisteners; and to provide other improvements as will hereinafter appear.

In the accompanying drawing Fig. 1 represents a plan of a thread moistening device embodying one form of the present invention, one end portion of the device being broken away to avoid duplication and to make better illustration possible; Fig. 2 represents a section on line 2—2 of Fig. 1; and Fig. 3 represents a perspective of the thread delivery tray and its adjuncts.

Referring to the drawing one form of the present invention consists of a trough 10 of elongated rectangular shape which, in the present instance, is provided at opposite ends with vertically disposed guides 11 which serve as ways for the respective ends of floatable rods 14. These guides 11 are preferably clipped to the upper edge of the end walls of the trough 10 and can thus be adjusted for proper spacing of the rods 14. Preferably the rods 14 are relatively short in order so as to reduce the friction on the thread during its traverse through the liquid in the receptacle 10 and prevent damage to the thread fibers. To support the guides 11 for the inner ends of the rods 14, a bridge piece 15 is mounted on the rim of the trough and extends transversely thereof. As here shown this bridge piece 15 is provided with a slot 16 to permit the clips 17, by which the ways 11 are connected, to move toward or away from each other to vary the distance between the rods 14 according to requirements and to align with the end ways 11.

For the purpose of bringing the threads 18 into the trough 10 for moistening purposes, a strip 20 is provided, preferably of metal, or other rigid material, which is arranged to be inserted in a slot 21 along the upper edge of one side of the

trough 10, this slot 21 as here shown being formed by a reverse bend 22 in the material of the trough. The strip 20 is provided with spaced eyelets 23 for respectively guiding the several threads into the trough 10. In order to conform to the sectional dividing of the trough (due to the rods 14 being generally about half of the length of the trough) each section has a strip 20 at the inlet side of the trough as will be understood.

At the discharge side of the trough 10 the marginal edge thereof is likewise reversally bent as shown at 24 to provide a slot 25 for the purpose of seating a downwardly turned flange 26 of a frame 27. The angular relation of this flange 26 to the bottom 28 of the frame is such as to incline the bottom 28 toward the trough so that drip and excess moisture removed from the threads will naturally flow back into the trough 10. The opposite side of the frame 27 is provided with an upstanding wall member 30 having eyelets 31 therein, correspondingly spaced to the eyelets 23 in the strip 20, and which serve to guide threads respectively out of the frame 27 and to the knitting machine.

For the purpose of subjecting moistened threads to the desired pressure for removing excess liquid and insuring a uniform moistening of the thread, the frame 27 has ends 29 provided with slots 32 which latter serve as guides and supports respectively for a series of rods 33, 34, 30 and 35 paralleling each other in spaced relation from the bottom 28 of the frame 27. While it is preferred to employ three rods for this tensioning purpose, the invention is not limited as to number. In the preferred arrangement the threads 18 are brought out of the trough 10 to pass over the first rod 33, then under the middle rod 34, and over the rod 35 to leave by way of the eyelets 31. With the locating of the rods 33, 34, and 35 in an inclined plane below the plane of the eyelets 31, the threads are thus given a relatively sharp angular bend in passing over the rod 33, a broad angular reverse bend in passing under the rod 34, and an opposite bend in passing over the rod 35 to enter the eyelets 31. The location of the rod 35 with respect to the eyelets 31 is such as to ensure a relatively sharp return bend to the threads in case the latter are caused to pass over the rods 33 and 34 and then under the rod 35. This is a modified weaving of the threads to obtain a variation in the applied tension and can be made at will. Thus the rods 33, 34 and 35 act as tension devices during the feeding of the thread and not only wipe the outer face of the thread to smooth any loose fibers but

also to squeeze out the desired amount of moisture so that the threads leaving the device will all be uniformly moistened.

As a means to prevent splashing of liquid as the threads leave the device and during the removal of excess moisture, the wall member 30 of the frame 27 is continued upwardly and inwardly over, but well spaced from the rods 33, 34 and 35, to form a baffle 36 located in an angular position to intercept all liquid tending to fly out of the frame 27 due to the travel of the threads through the tension members.

In connection with the rods 14 it should be noted that these are preferably sealed glass tubes light enough to rest upon the threads with little friction and maintain them submerged while travelling through the liquid. The rods 33, 34 and 35 are of glass, or any other suitable material, having a smooth surface, and each is sufficiently heavy to provide the necessary tension but still light enough to yield vertically to ensure free feeding of the threads at all times.

It should be noted that the bridge piece 15 is also removably mounted on the trough by having its ends bent at the correct angle so that each can be inserted in one of the slots 21 or 25. It will therefore be evident that not only is the bridge piece 15 removable but also the strips 20 and frame structure 27.

While only a single form is here shown in which this application may be embodied, it is to be understood that the invention is not limited to any specific construction but might be applied to various forms without departing from the spirit of the invention or the scope of the appended claims.

Having thus described my invention, I claim:—

1. A thread moistening device comprising a trough for liquid, inlet guides for respectively directing threads into said trough, exit guides for respectively directing said threads out of said trough, means for causing said threads to be submerged while passing through said trough, and tension means including yieldingly mounted horizontal rods between said trough and exit guides for removing excess moisture from said threads.

2. A thread moistening device comprising a trough for liquid, inlet guides for respectively directing threads into said trough, exit guides for respectively directing said threads out of said trough, means for causing said threads to be submerged while passing through said trough, tension means including yieldingly mounted rods between said trough and exit guides for removing excess moisture from said threads, and means for returning said excess moisture to said trough.

3. A thread moistening device comprising a trough for liquid, inlet guides for respectively

directing threads into said trough, exit guides for respectively directing said threads out of said trough, means for causing said threads to be submerged while passing through said trough, tension means including yieldingly mounted rods between said trough and exit guides for removing excess moisture from said threads, and a baffle for preventing liquid from splashing outside of said trough.

4. A thread moistening device comprising a trough for liquid, inlet guides for respectively directing threads into said trough, exit guides for respectively directing said threads out of said trough, means for causing said threads to be submerged while passing through said trough, a frame attached to the exit side of said trough having ends provided with slots, and rods respectively located between opposite pairs of said slots, certain of said rods engaging one side of said threads and the remainder engaging the opposite side of said threads, whereby excess moisture is removed from said threads.

5. A thread moistening device comprising a trough for liquid, inlet guides for respectively directing threads into said trough, exit guides for respectively directing said threads out of said trough, means for causing said threads to be submerged while passing through said trough, a frame attached to the exit side of said trough having ends provided with slots, rods respectively located between opposite pairs of said slots, certain of said rods engaging one side of said threads and the remainder engaging the opposite side of said threads, whereby excess moisture is removed from said threads, and a baffle attached to said frame and extending over said rods in spaced relation.

6. A thread moistening device comprising a trough for liquid, means forming slots extending respectively along two opposite edges of said trough, a strip having eyelets to respectively guide threads towards said trough, means on said strip to seat in one of said slots to mount said strip in operative position, a frame having eyelets to respectively guide threads away from said trough, means on said frame to seat in the other of said slots to mount said frame, and means to submerge said threads in a liquid in said trough.

7. A thread moistening device comprising a trough for liquid, floatable rods in said trough for submerging travelling threads in said liquid, pairs of ways for guiding the ends of said rods, and means for mounting said ways for movement toward and away from each other, whereby the spacing of said rods can be adjusted at will.

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