Jan. 4, 1944. P. H. AURICH 2,338,394

HUMIDIFIER

Filed Nov. 13, 1941 2 Sheets-Sheet 1

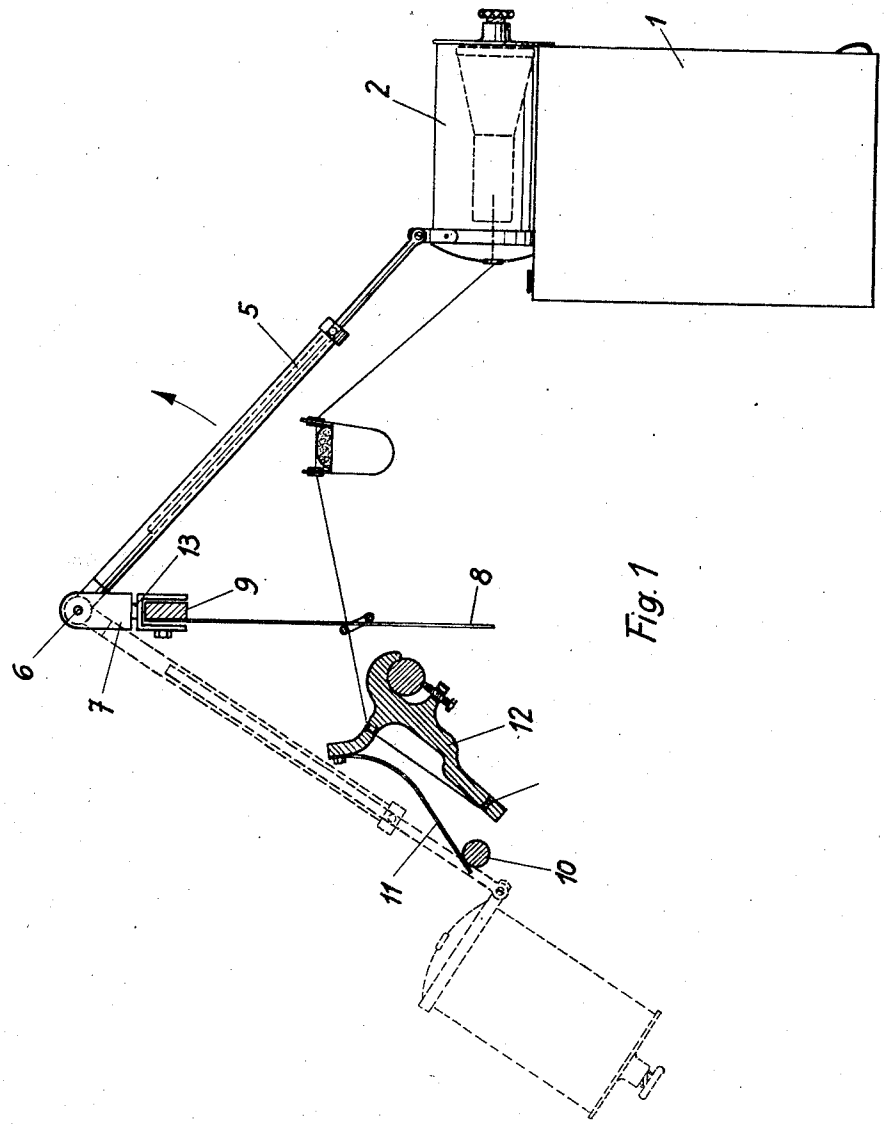


Fig. 1

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Fig. 2

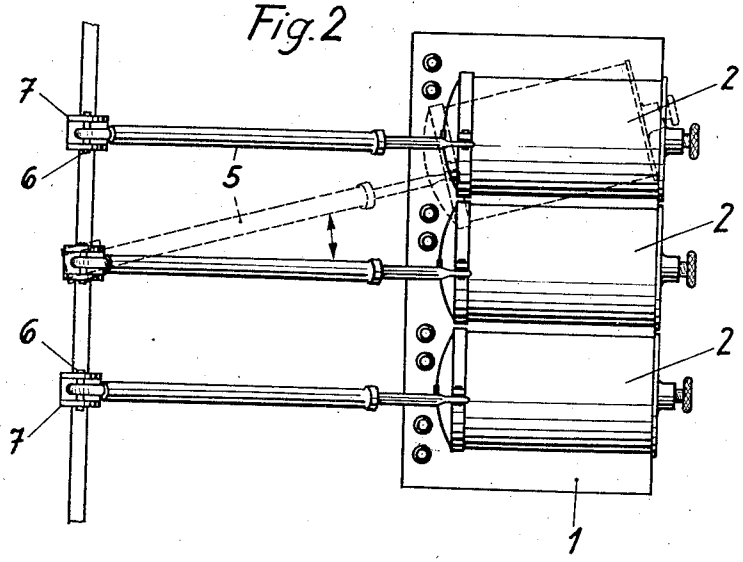
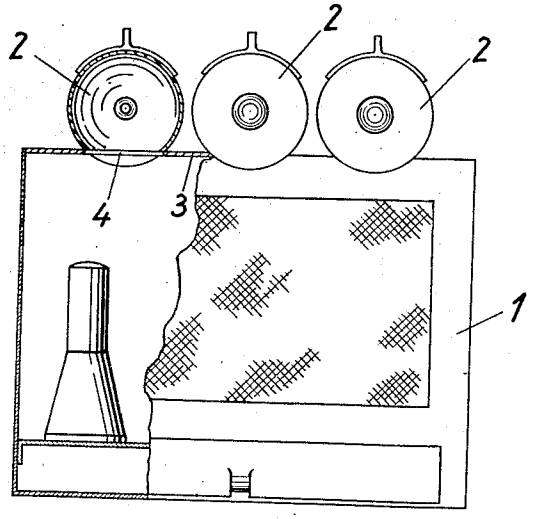


Fig. 3



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HUMIDIFIER

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In Germany June 18, 1940

5 Claims. (Cl. 66—125)

This invention relates to a humidifier for flat knitting frames.

Boxlike humidifiers of known type arranged in the rear part of flat knitting frames hold as a rule not only the bobbins for reinforcing and other threads but also those for the ground thread. In view of the fact that the consumption of ground thread is much greater than that of the other threads and may require for instance the exchange of thirty or more spools to one bobbin of other thread per time unit, this arrangement is open to serious objections. It is difficult to reach the inside of a box through its rear wall usually constructed in the form of a sliding window having two or more wings or sashes which easily stick in their guides and resist being opened, or when opened expose only part of the interior of the box. In case two spools have to be simultaneously exchanged it is often necessary successively to open two sashes to perform the operation. These disadvantages could of course be overcome by departing from the usual construction of the rear wall of the boxes, but this would cause new difficulties, since flat knitting frames are as a rule arranged in pairs with their backs facing each other as closely as possible to save floor space. For this reason, folding or swinging doors in the rear of such humidifying boxes are out of the question.

In one of the known constructions designed to solve the problem concerned the ground thread spools are placed in separate individual casings disposed on top of the humidifying boxes, so that these spools can be exchanged independently of the boxes. The troublesome opening and closing of the boxes at each exchange of a spool is thus omitted, and the spools are more easily accessible, since they are positioned outside the other spools and on a higher level. As the single casings containing the ground thread spools are located above the plane of the machine head, the spools may be exchanged from the front side of the frame.

In the prevailing arrangements of this kind the individual casings for the ground thread spools are of cylindrical shape and, except for the thread take-up opening, completely closed and sealed, the spools for the casings being moistened before they are inserted therein, and evaporation of the liquid is prevented due to the sealing of the casings. This construction is, however, disadvantageous for several reasons. Apart from the fact that the moistening of the spools requires a separate operation, certain provisions must be made to seal the casings so tightly that evaporation of the moisture is completely avoided. This involves a comparatively complex and expensive construction of the individual casings and, furthermore, renders them difficultly accessible. Another drawback is that it is practically impossible to provide for maintaining the same moisture content in the spools disposed in the single casings and in those placed in the humidifying boxes.

In a humidifier for flat knitting frames comprising a humidifying box and a plurality of individual casings placed on the top thereof and adapted each to receive a spool these troubles are eliminated according to the invention by leaving the casings open at their bottom and providing also an opening at each of the bearing points of the casings in the top of the humidifying box, so that the spools placed in the casings are kept moist by the liquid contained in the humidifying box.

It is known to connect a number of individual spool casings with a common humidifying box in such manner that all the spools in the casings are saturated with the liquid of the box. For this purpose the vertical cylindrical casings are either kept open below or provided with openings in their bottom, but the arrangement differs from that of the invention in so far as the casings for the ground thread spools are placed in a single row with those intended for the reception of reinforcing or other thread spools and are thus not removed from the space containing these other spools. The result is that these known devices are quite complex and expensive, which is not necessary, since experience has shown that sufficient moistening of the reinforcing and other thread spools can be effected merely by arranging them on ordinary humidifying boxes and that only the ground thread spools need be placed in separate casings. Furthermore, owing to their arrangement in a row with the other individual casings, the casings for the ground thread spools in these known devices are not brought within better reach as provided by the invention. Another drawback of these known humidifying devices is that much space is lost due to provision of a single casing for each spool, so that, leaving the ground thread spools out of consideration, fewer spools can be accommodated than in the humidifying box according to the invention. This feature is of great importance, because an up-to-date flat knitting frame has to handle a large number of other threads besides

the ground threads and even the full space of the ordinary humidifying boxes hardly suffices at times to hold all these auxiliary thread spools.

A further feature of the invention resides in securing each individual casing to a rod and in rendering these rods movable about a horizontal shaft disposed parallel to the longitudinal axis of the machine above the casings.

By a corresponding arrangement of this shaft it thus becomes possible to swing the casings to the front for exchanging their spools, where they are easily accessible to the operator who need therefore not walk to the rear of the machine. In view of the large number of exchanges of ground thread spools required in the course of working, the relief afforded the operator is considerable.

In horizontally disposed cylindrical humidifying glasses for single spools it is known to secure the bottom of the glass supporting the spool holding means to the rear ends of two parallel bars which when the glass is used are horizontally inserted in guides below the container and are drawn out of these guides for exchanging a spool, so that they can then be swung about their front ends with their bottom down. In contradistinction to the invention, however, not the entire container is movable and, above all, not in forward direction. As these horizontal casings face with their bottom to the rear and the turning point of the bars is located below the glass, the bottom can be swung out only to the rear. This is important, since in consequence thereof the spools must be exchanged as usual in the rear of the machine.

One form of the invention is illustrated by way of example in the accompanying drawings, in which

Figure 1 is a side view of the humidifier according to the invention;

Fig. 2, a top view of a humidifying box with individual spool casings arranged thereon; and

Fig. 3 a rear view of a humidifying box with casings, partly broken up.

The humidifier comprises a box 1 of known type for the reinforcing or other threads and individual casings 2 disposed on top of the box 1 for the ground thread spools. The box 1 serves in known manner for the reception of a plurality of spools whilst each casing 2 accommodates only one spool. As particularly indicated to the left of Fig. 3, the casings 2, according to the invention, are open below and the top 3 of the box 1 is also provided with an opening 4 at each bearing point of the casings 2. The humid air produced by a liquid provided in the lower portion of the box 1 passes through the openings 4 and the corresponding openings in the lower portion of the casings 2 into the latter. As shown in Figs. 1, 2, one end of a rod 5 variable as to length is connected to the upper front portion of each casing 2, and the other end thereof is pivotally disposed on a shaft 6 which occupies a horizontal position and extends parallel to the longitudinal axis of the machine. The shaft 6, in the example shown, is located above the thread tensioning means of the machine by securing the bearings 7 supporting the shaft 6 to a rail 9 holding the hairpin tension appliance 8.

This arrangement of the casings 2 makes it possible to swing them into the front position indicated by broken lines in Fig. 1 for exchanging spools, etc., where they are readily accessible to the operator, the more so as in this position the opening in the underside of the casings 2 faces him. In the construction shown in Fig. 1 the fixed bar 10 usually serving for holding back the leaf springs 11 of the movable thread tensioning means 12 during downward motion of the latter is utilized to act as limiting stop for the swinging motion of the casings 2 whose rod 5 is placed on the bar 10. The bearings 7 of the rods 5 are, moreover, movable about a vertical shaft 13, Fig. 1, to permit lateral motion of the casings 2 for exposing at will any openings 4 in the top 3. Broken lines in Fig. 2 indicate such a position of the central casing 2 which is simply placed on the adjacent casing, so that the openings 4 in the top 3 of the box 1 permit access to the spools in the latter casing.

It is expressly pointed out that the equipment of the casings 2 with the rods 5 variable as to length and the arrangement of the latter on the shaft 6 may be used also in the known humidifiers, in which the individual casings horizontally disposed on the top of the humidifying box are completely closed with the exception of their thread take-up opening.

I claim:

1. A humidifier for flat knitting frames or the like, comprising a box containing a liquid, a plurality of casings horizontally disposed on the top of said box and adapted each to receive a spool, a passage in the bottom of each of said casings and an opening in said top at each bearing point of said casings to provide the spools placed in said casings with moisture from the liquid in said box.

2. A humidifier for flat knitting frames or the like, comprising a box containing a liquid, a plurality of casings horizontally disposed on the top of said box and adapted each to receive a spool, a passage in the bottom of each of said casings, an opening in said top at each bearing point of said casings to provide the spools placed in said casings with moisture from the liquid is said box, a rod secured with one end to each casing and a pivoted horizontal shaft to which the other end of each rod is secured, said shaft extending parallel to the longitudinal axis of the frame above said casings.

3. A humidifier for flat knitting frames or the like, comprising a box containing a liquid, a plurality of casings horizontally disposed on the top of said box and adapted each to receive a spool, a passage in the bottom of each of said casings, an opening in said top at each bearing point of said casings to provide the spools placed therein with moisture from the liquid in said box, a rod secured with one end to each casing and a pivoted horizontal shaft to which the other end of each rod is attached, said shaft extending parallel to the longitudinal axis of the frame above said casings and in front thereof and of the thread tensioning means of the frame.

4. A humidifier for flat knitting frames or the like, comprising a box containing a liquid, a plurality of casings horizontally disposed on the top of said box and adapted each to receive a spool, a passage in the bottom of each of said casings, an opening in said top at each bearing point of said casings to provide the spools placed therein with moisture from the liquid in said box, a rod secured with one end to each casing, a pivoted horizontal shaft to which the other end of each rod is attached, said shaft extending parallel to the longitudinal axis of the frame above said casings and in front thereof and of the thread tensioning means of the frame and bearings for

said shaft secured to the rail supporting the hairpin tensioning appliance of the frame.

5. A humidifier for flat knitting frames or the like, comprising a box containing a liquid, a plurality of casings horizontally disposed on the top of said box and adapted each to receive a spool, a passage in the bottom of each of said casings, an opening in said top at each bearing point of said casings to provide the spools placed therein with moisture from the liquid in said box, a rod secured with one end to each casing, a pivoted horizontal shaft to which the other end of each rod is attached, said shaft extending parallel to the longitudinal axis of the frame above said casings and in front thereof and of the thread tensioning means of the frame, bearings for said shaft secured to the rail supporting the hairpin tensioning appliance of the frame and a vertical shaft about which said bearings are movable.

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