

L. FESSMANN & G. HÄMMERLE.
 COMBINED YARN GUIDING, CLEARING, AND TENSION DEVICE.
 APPLICATION FILED OCT. 30, 1908.

1,043,309.

Patented Nov. 5, 1912.

2 SHEETS-SHEET 1.

Fig. 1.

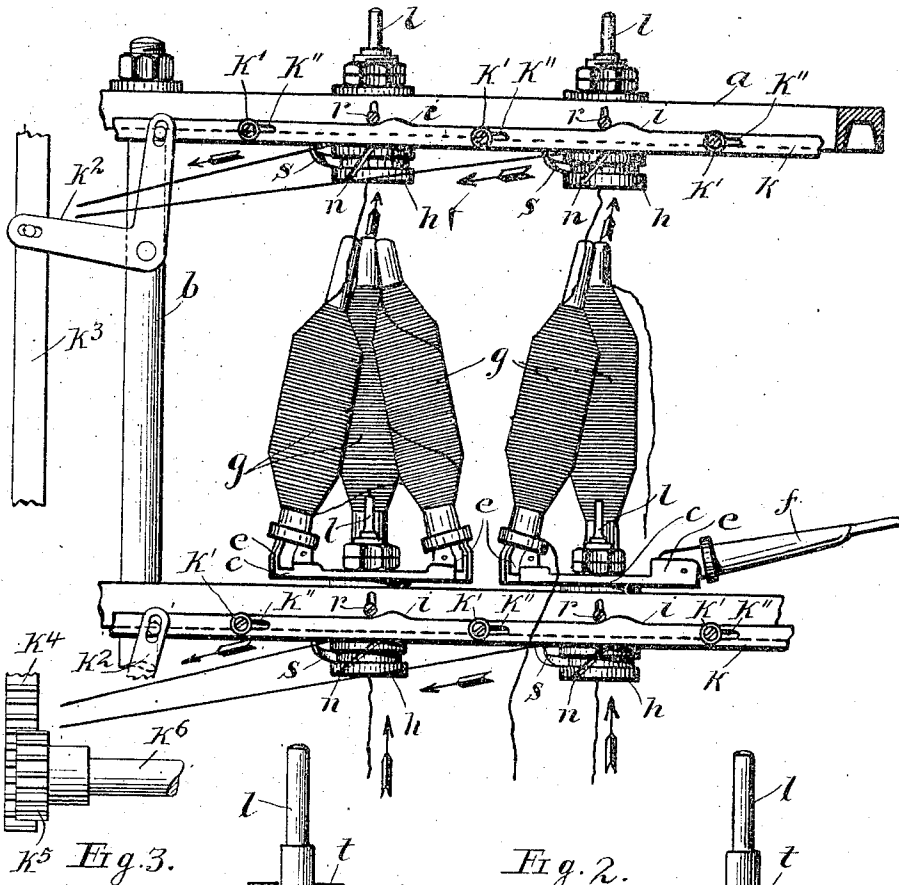


Fig. 3.

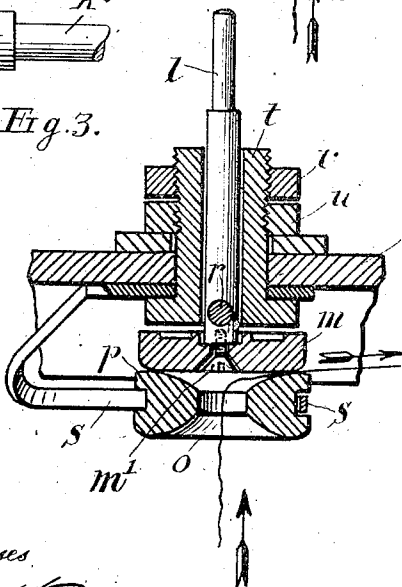
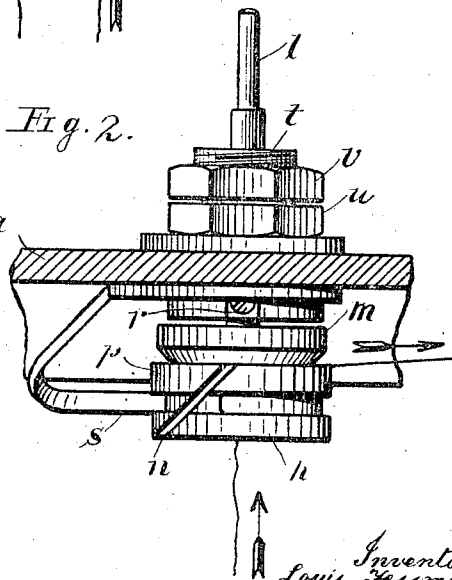


Fig. 2.



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Fig 4

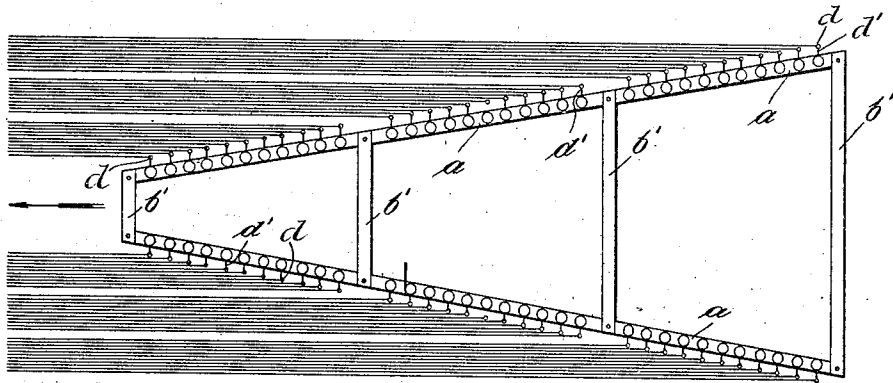
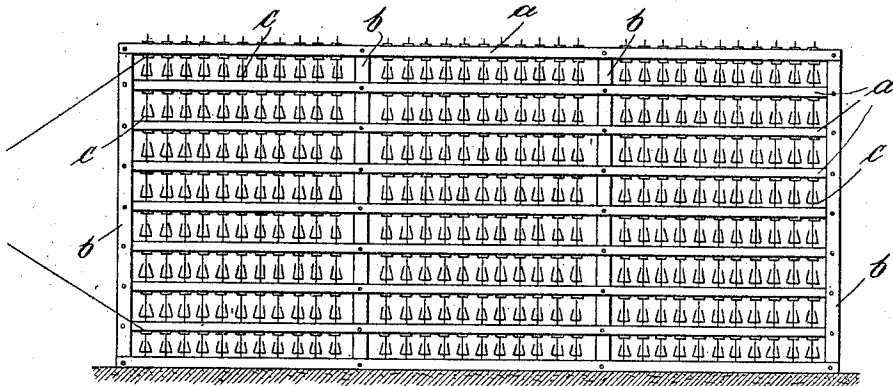


Fig 5



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UNITED STATES PATENT OFFICE

LOUIS FESSMANN AND GEBHARD HÄMMERLE, OF AUGSBURG, GERMANY.

COMBINED YARN GUIDING, CLEARING, AND TENSION DEVICE.

1,043,309.

Specification of Letters Patent.

Patented Nov. 5, 1912.

Application filed October 30, 1908. Serial No. 460,238.

To all whom it may concern:

Be it known that we, LOUIS FESSMANN, a citizen of the German Empire, and GEBHARD HÄMMERLE, a citizen of the Empire of Austria-Hungary, both residing at Augsburg, Germany, have invented certain improvements in combined yarn guiding, clearing, and tension devices, such devices being intended for use, more especially, in connection with mechanical warping-frames.

Our invention is especially designed to be employed in a mechanical warping machine of a construction and character designed by us for use in winding directly from the spinning-frame bobbins on to the receiving beam in the former machine, and by the use of which the usual operation of winding from bobbins or cops upon spools, and the use of the ordinary creel for such spools at the time of unwinding from the said spools in a warping machine, are rendered unnecessary. Thereby much labor is saved, and much floor space is made available for other purposes. The manner of winding the cop and bobbins is not altered, nor is their shape changed at all.

In the warping machine aforesaid we employ bobbin-supporting means providing for receiving reserve supply-bobbins or cops, which are grouped closely with the one from which unwinding is actually proceeding at any given moment, which enables the inner end of the yarn or thread on the latter bobbin or cop to be joined, as by tying, to the outer end of that of a second bobbin or cop, and so on throughout the group, so that when the yarn or thread of one bobbin or cop becomes completely unwound the unwinding will immediately continue from the next bobbin or cop in turn, and so that fresh bobbins or cops may be supplied as soon as the previous ones have become exhausted, the unwinding operation thereby proceeding continuously and without interruption. Thereby the waste portions of yarns, which in the case of other methods of unwinding have had to be left on the warping bobbins, and have added unnecessary weight, are also obviated.

Briefly stated, the invention has relation to devices for guiding the yarns so as to

facilitate the drawing-off or unwinding, and, in addition, clearing them of lint and foreign particles adherent thereto, and regulating the tension thereof.

The invention comprises novel and improved combined yarn-guiding, clearing, and tension-regulating devices, and novel means of providing for the release and discharge of accumulations of loose material at the said devices.

While the features of the invention are capable of being employed in connection with various kinds of machines, they have been designed more particularly for use in the bobbin-frames or creels of warping machines.

The features, themselves, of the invention are illustrated in the accompanying drawings, which also indicate the application of such features to a bobbin-frame or creel.

In the drawings,—Figure 1 shows in side elevation a portion of the bobbin-frame or creel of a warping machine, and improved yarn-guiding, etc., devices embodying the invention applied thereto. Fig. 2 is a view showing a portion of one of the horizontal rails or channel-bars of Fig. 1 in longitudinal vertical section, and a combined guide, clearer, and tension device applied thereto. Fig. 3 is a view showing the parts of Fig. 2 mostly in vertical section in a transverse plane. Fig. 4 is a plan view of a warping machine bobbin-frame or creel. Fig. 5 is a side elevation of said bobbin-frame or creel.

Referring briefly, first, to the bobbin-frame or creel, it is made with two sides, each supporting bobbins or cops. These sides converge toward each other in the direction of one end of the frame, as heretofore in some instances. Each side is composed of longitudinally-extending horizontal rails *a, a*, in the form of channel-bars, (see Figs. 1, 2, 3) and uprights *b, b*. The said rails or channel-bars are supported one above another upon the said uprights. As indicated in Fig. 5, the arrangement of the horizontal rails or channel-bars and uprights is such as to produce in each side of the warping frame or creel a number of compartments. As shown in Fig. 5, also, a plu-

5 reality of bobbin or cop-carriers is contained within each such compartment. The two sides of the warping frame or creel are joined together and the whole stiffened by cross-pieces b' , b' , Fig. 4. At d , d , Fig. 4, are glass rods carried by outstanding small brackets d' , d' , and around which the yarns change direction after leaving the guiding, clearing, etc., devices aforesaid. From said
 10 glass rods the yarns proceed to the winding mechanism.

The manner in which the yarn travels from the cops through the combined thread guide, clearer, and tension-device on its way
 15 to the warping rollers can be seen from Figs. 1, 2 and 3. In order to prevent the thread rubbing against the rough iron parts and to prevent the numerous threads from colliding with one another, they are led
 20 around the glass rods d just mentioned.

Each of the horizontal rails or channel-bars a , with the exception of the top one, supports a series of bobbin or cop-carriers, and each thereof, with the exception of the
 25 bottom one, supports a series of the combined guides, clearers, and tension-devices. These said devices are usually termed valves or thread-valves in the art.

Each cop-carrier comprises a base c and
 30 a series of bobbin or cop-receiving spindles f , Fig. 1. The said spindles are hinged or pivoted between pairs of upstanding lugs e on said base, so that a spindle may be swung downward and outward, as represented at
 35 the right hand side of Fig. 1, into position to enable an empty bobbin or cop-tube to be removed therefrom and a full bobbin or cop to be applied thereto, without interfering with the other bobbins or cops, and, what is
 40 more important, without interfering with the unwinding yarn or thread as it circles about its bobbin or cop. This capacity of the respective spindles to be swung outward for the purpose of supplying fresh bobbins or
 45 cops enables the bobbins or cops to be set more closely together upon the carrier, and to converge much more closely together at their upper ends, than would be possible otherwise. It enables the bobbins or cops to be brought
 50 more nearly in line with a line passing down through the center of the delivery-guide above them, and renders it possible to locate the said guide a very short distance above the upper ends of the bobbins or cops. Thereby the
 55 extent of the ballooning of the unwinding yarn or thread as it circles around the bobbin or cop from which it is being drawn is very much reduced, which not only reduces liability to breaking of such yarn or thread,
 60 but enables the carriers to be set closer to one another, thereby reducing the size of the bobbin or cop-supporting frame and consequently the extent of floor-space that is occupied.

The base c of each cop-carrier rests upon
 65 the upper surface of the supporting rail or channel-bar a therefor, and is secured in place upon the said rail or channel-bar by means of a bushing t having a flanged lower end, the stem of such bushing being extended
 70 up through a hole in the base c , as shown in Fig. 3, the screw-threaded portion of the said stem having applied thereto the nuts u and v between which and the upper surface of the rail or channel-bar the base c is
 75 clamped.

When the cops are placed on the spindles f , a little yarn or thread is unwound from each cop and the inner end of the yarn or thread of one cop is connected to the outer
 80 end of the yarn or thread of the next cop in the way hereinbefore mentioned. Before reaching the warping roller, the thread passes through the combined guide, clearer, and tension device which is located immediately above the upper ends of the cops upon the spindles f , and is cleared as it passes therethrough, so that it reaches the warping roller perfectly clean and at the
 85 necessary tension.

The said combined guide, clearer, and tension device is mounted upon the rail or channel-bar a next above that on which the cop-carrier is mounted. It comprises essentially
 90 a seat or guide p in the form of a ring, and a plate or disk m which rests upon the top of the said ring. The yarn or thread unwinding from one of the bobbins or cops on the cop-carrier below passes up through the bore o of the ring p , and then turns, passing
 100 outward between the ring and plate or disk. The latter rests by gravity upon the yarn, the friction due to the passage of the yarn through the bore o of the ring, and to the bending of the yarn or thread nearly at
 105 right angles over the ring, as well as to the passage of the yarn or thread between the surfaces of the ring and plate or disk, imparting the required tension to the yarn or thread. As the yarn or thread passes
 110 through the device, loose particles are detached therefrom, the bore o of the ring permitting the said particles to fall away. The plate or disk m is connected loosely by
 115 a screw m' with the lower end of a stem or pin l , which occupies the central bore of the bushing and is movable vertically therein. This provides for confining the said plate or disk in proper working position, while leaving it free to be raised by an operative
 120 as the latter introduces the yarn or thread between it and the top of the ring, and also free to descend by gravity so as to rest upon the top of the ring and the yarn or thread, and in addition permits it to accommodate
 125 itself to variations in the thickness of the yarn or thread, or knots or loops.

The escape of loose material which may be

detached at the combined guide, etc., and which might tend to clog the device and prevent the plate or disk *m* from closing and acting properly, is provided for in the following manner. A slide-bar *k*, Fig. 1, is mounted upon one side-flange of the rail or channel-bar by which the said combined guide, etc., is supported, and said slide-bar is held to the said rail or channel-bar by means of screws *k'*, *k'*, the stems of which occupy slots *k''*, *k''*, formed in the slide-bar and extending longitudinally of the latter. This mode of connecting the slide to the rail or channel-bar provides for movement of the slide in the direction of its length. The slide is formed or provided with an upwardly projecting nose or cam-portion *i* adjacent each combined guide, etc. A horizontal pin *r* projects from upright stem or pin *l* out through a vertical slot in the rail or channel-bar, and extends over the upper edge of the slide. Reciprocating movement imparted to the slide causes the nose or cam-portion *i* to pass back and forth beneath pin *r*, thereby raising the pin *r*, stem or pin *l*, and plate or disk *m* and leaving them free to descend by gravity again. The slide *m* is connected in practice with means whereby it automatically is moved back and forth every few seconds. Such means may be of any approved character. Herein we have shown the slide *k* engaged with one arm of a bell-crank *k²*, the other arm of which is engaged with a vertically-movable upright bar *k³*. Said bar is formed or provided at its lower end with a toothed rack *k⁴*, with which engages a spur-pinion *k⁵* on a shaft *k⁶*. Shaft *k⁶* has, in practice, a turning movement imparted thereto, first in one direction and then in the other, so as to alternately raise and lower the bar *k³* and this raising and lowering of the bar operates through the bell-crank *k²* to communicate the required back and forth endwise movement to the slide *k*. By this means the disk *m* is raised sharply at intervals, so that the foreign bodies fall out and the thread runs on again under the correct tension. The ring *p* which has an oblique slot *n* for admitting the thread into its bore *o*, is preferably constructed of glass as are also the other parts used solely for guiding the thread. The ring *p* is held in a hook-shaped supporting clamp *s*, and can easily be removed and replaced by hand, which is also true of all the various parts. As can be seen from Fig. 3, the bushing *t* passes through a hole in the upper part of the clamp *s*, and the latter is clamped by the flange of said bushing to the rail or channel-bar to which such bushing is applied.

A machine embodying the features herein shown and described does not require the weaving yarn to be spooled, but enables the

yarn to be wound directly from the cops on to the warping rollers, so that it replaces the winding machines now in use, which require so much attention, and in themselves represent a considerable amount of capital.

We do not lay claim herein to the bobbin or cop-supporter, or to the feature of construction of the frame or creel, inasmuch as they are made the subjects of claims in divisional applications.

Having fully described our invention, what we claim and desire to secure by Letters Patent is:—

1. In yarn-delivering or unwinding devices, the combination with a leading-off guide having a passage for a yarn or thread coming from a bobbin, cop, or other source of supply, and a surface across which said yarn or thread then travels, of a plate or disk making contact with the said surface and pressing upon the said yarn or thread as the latter thus travels, and means for automatically separating said plate or disk and guide at intervals to permit escape of loose particles.

2. In yarn-delivering or unwinding devices, the combination with a leading-off guide having a passage for a yarn or thread coming from a bobbin, cop, or other source of supply, and a surface across which the said yarn or thread then travels, of a plate or disk making contact with the said surface and pressing upon the said yarn or thread as the latter thus travels, a cam-device operatively connecting with said plate or disk, and means for actuating said cam-device to automatically separate the plate or disk and guide at intervals to permit escape of loose particles.

3. In yarn-delivering or unwinding devices, the combination with a leading-off guide having a bore *o* and a surface across which the yarn or thread travels after passing through the said guide, of a disk or plate pressing against the said surface and the yarn or thread, a guided stem in connection with said disk or plate, an outward projection from said stem, a slide having cam-portions to act against said pin to separate said disk or plate from the said surface of the guide, and automatic means for reciprocating the slide.

4. In combination, a guide for the yarn or thread, a presser-plate between which and the said guide the traveling yarn or thread is pressed, a stem or carrier with which said plate is loosely connected with freedom to accommodate itself to variations in the size of the said yarn or thread, and means automatically separating said plate from the guide at intervals.

5. The combination with a frame, and a slide movable thereon, of a clamp attached to the frame, a perforated guide carried by

said clamp, a perforated box secured in said frame, a guide pin slidable in said box, means secured to said guide pin extending above said slide and adapted to be lifted
5 thereby, and a disk or plate loosely connected with said pin and normally resting on said guide.

In testimony whereof we have hereunto

set our hands, in the presence of two subscribing witnesses.

LOUIS FESSMANN.

GEBHARD HÄMMERLE.

Witnesses:

MATHILDE K. HELD,

LOUIS MUELLER.