

W. Kumbel.

Stretching Leather Bands,

No. 4,455,

Patented Apr. 11, 1846.

Fig. 1.

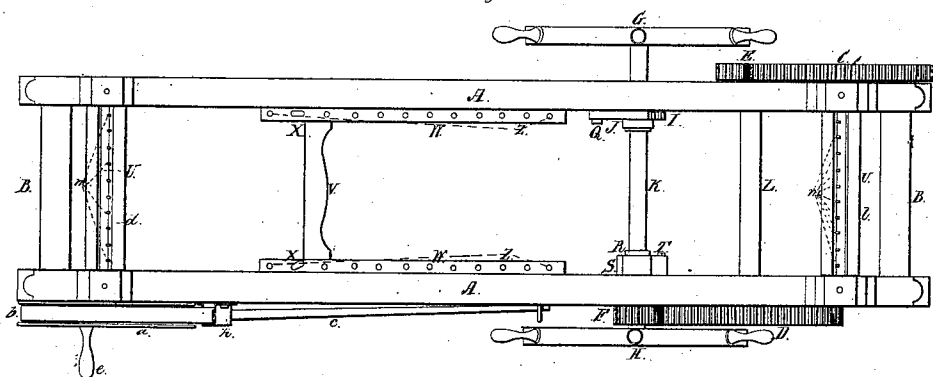


Fig. 2.

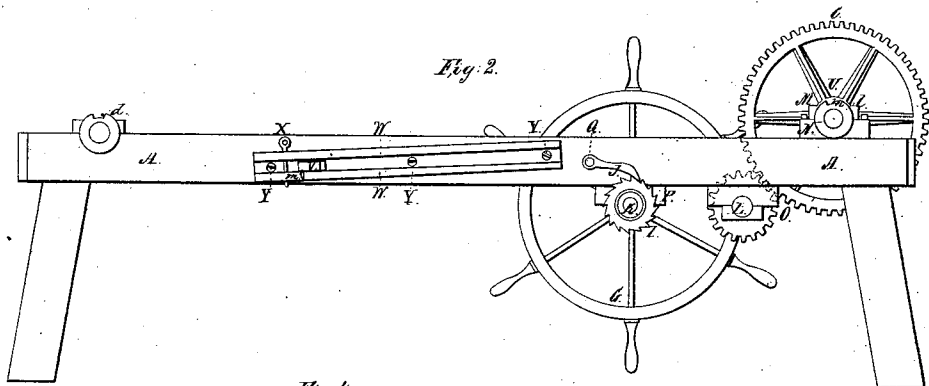


Fig. 4.



Fig. 5.

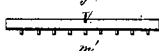
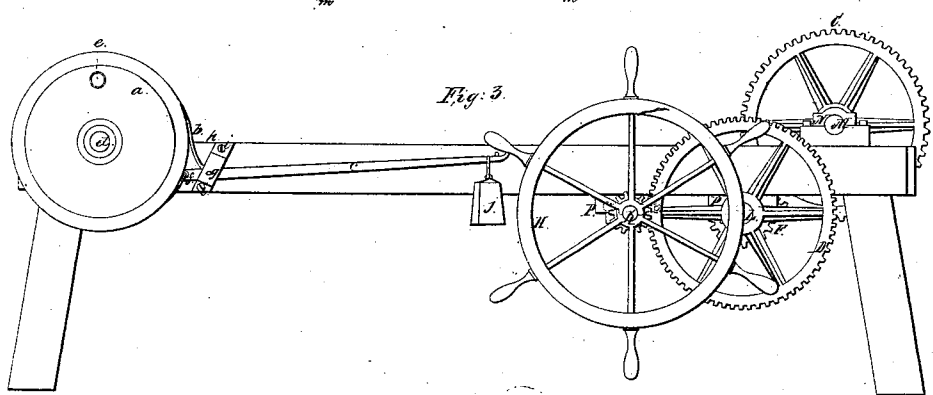


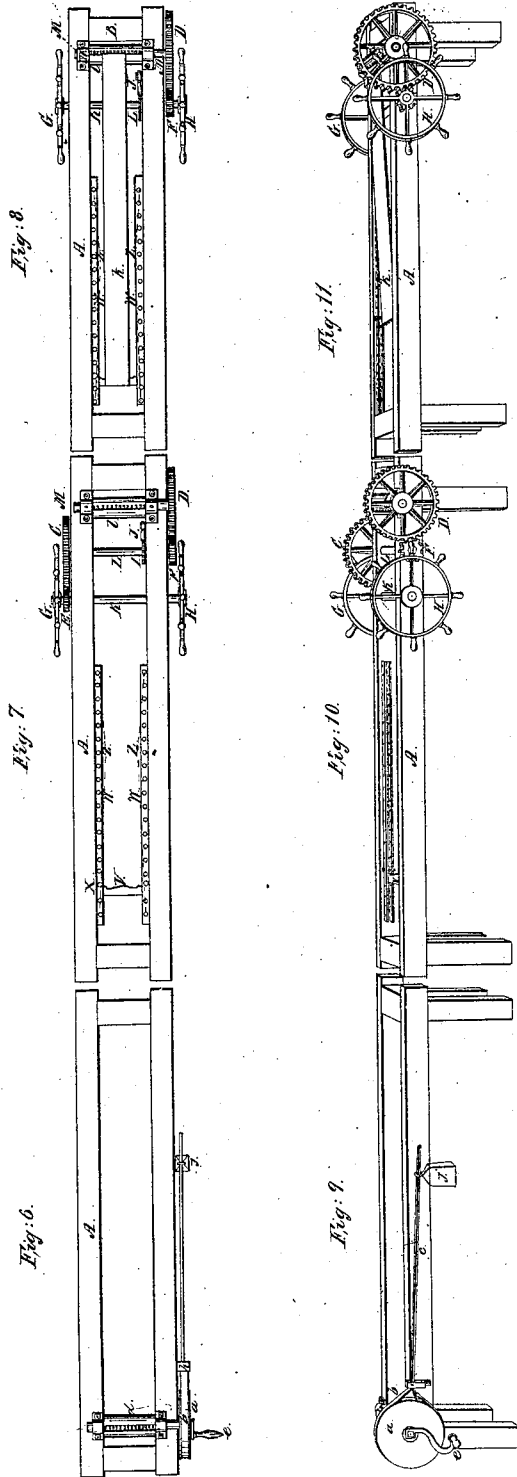
Fig. 3.



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# UNITED STATES PATENT OFFICE.

WM. KUMBEL, OF NEW YORK, N. Y.

## STRETCHING LEATHER BANDS.

Specification of Letters Patent No. 4,455, dated April 11, 1846.

*To all whom it may concern:*

Be it known that I, WILLIAM KUMBEL, of the city, county, and State of New York, have invented a new and useful Improvement in the Mode of Making Stretched and Straightened Leather Bands, &c., and that the following is a full, clear, and exact description of the machines employed and the mode of using the same, reference being had to the accompanying drawings, making part of this specification.

The making of leather bands for driving machinery has heretofore been attended with great difficulty from the fact that the texture of the leather of which they are made differs very much not only in different hides, but in the parts of the same hide, and therefore when the band is completed, by connecting together the several pieces, the tension to which it is subjected will cause it to stretch unequally, the parts cut from, or nearest to the back being the strongest will stretch less than the parts from, or nearest to the belly, and as in the same piece one side will be stronger than the other, it will do all the work, when the band is applied without previous stretching under a tension greater than that to which it is to be subjected when in use, for that is the only part that hugs the drum or pulley, the weaker parts running loose. The stronger parts will however continue to stretch, (which is attended with much inconvenience) until every part is brought to the proper degree of tension; but this stretching necessarily renders the band crooked and less effective and liable to run off the pulley. To obviate these difficulties it becomes necessary first to stretch each piece separately, trim it straight, and after connecting together the separate pieces to stretch the whole. The stretching of the connected parts together will again produce inequalities along the edges which require to be trimmed. In this way when the band is completed, it will not only continue to run straight, but every part of its surface will hug the drum or pulley, and thus be more effective than when made in any other way. Another consideration is of importance. As the ends of the pieces are connected together by rivets, the pieces should be stretched by the holes through which the rivets pass, (or by others cut beyond them in the same line) to form the connection, for without this precaution the tension to which the band is subjected in

operation would of course be different, and render its edges unequal. The machine which I employ for this purpose consists of a single or compound geared windlass, the drum of which is recessed and provided with a series of tangential pins to receive and hold one of the punched ends of the piece of leather, termed the "segment," so that as the leather stretches it can be wound onto the cylinder without any projection therefrom, combined with a follower, also provided with the pins to hold the other end of the leather segment, which slides in ways provided with holes and check pins to afford the means of readily adapting the machine to various lengths of leather, and also combined with a like cylinder with pins the reverse of those on the cylinder of the windlass, and provided with a friction pulley strap and weighted lever to regulate the amount of tension to be applied to the band, this being employed in connection with the windlass to stretch the entire band after the stretched segments have been put together. This arrangement being adapted to all lengths of bands, for while a portion is under tension, the other is rolled up on one of the cylinders, and then the stretched part rolled up on the other cylinder and the rest then stretched.

Figure 1, Plate 1 in the annexed drawings (the same letters indicating like parts in all the figures) exhibits a top or bird's eye view of the upper surface of the bed frame, viz: the top side rails (A, A) and the upper end rails (B, B) on which said machinery is supported. The under frame work of said bed, is somewhat similar to that of a cabinet maker's bench, and as used by me, is made of wood, about 12 feet long, 3 feet wide, and 3 feet high. The form, which is not material as to parts, I have given in Figs. 2 and 3, in the annexed drawings; Plate 1, and also in the perspective drawings, Figs. 6, 7, 8, 9, 10, and 11, Plate 2nd. The operative parts of said machine are arranged in three distinct clusters or groups, which I shall describe separately in their regular order of arrangement and coöperation. The first group is a simple arrangement of wheels and pinions, conjointly forming the ordinary double geared windlass. In this train there are two cog wheels (C, D), and two pinions (E, F), also two windlass wheels G, H, and one ratchet wheel (I) and pawl (J). Said wheels and pin-

ions are fastened upon and near the outer ends of the shafts (K, L, M) which shafts are placed parallel across said bed-frame, and revolve on journals in boxes which boxes are fastened to the top side rails (A A), two pairs below, and one pair above, as shown in Figs. 2, and 3, Plate 1, letters (N, O, P). The said ratchet wheel is fixed on the shaft (K) close up to the inner face of one of the side top rails, to which rail the pawl is attached, and suspended on the bolt, or screw pin (Q), as shown in Fig. 2, elevated cut section. Upon the said shaft (K) near the inner face of the opposite top rail is a collar (R), between which and said rail, a hinge cap (S) is fitted, so as to hold said shaft from moving endwise, there being no shoulders to the other journals on the said shaft, consequently when one end of said cap is raised (it being suspended on the pin (T) at the hinge end) the shaft is forced endwise and the pinion (F) upon the same is thrown out of gear at pleasure.

Upon the shaft (M) is a metal cylinder (Z) secured centrally and extending in length the whole inner width of the bed frame. In one side of this cylindrical roller or windlass beam, a longitudinal recess or niche (U) is cut or cast about two inches in depth and width. About midway in one of the side walls of this niche a horizontal row of metal pins (*m*) are firmly inserted, projecting tangentially about half way across said niche or recess (more or less) as shown in Figs. 1 and 2, letter (*v*).

For manufacturing narrow bands &c., the intermediate wheel (D) and shaft (L) may be dispensed with, making it a single geared machine as shown in Figs. 8, and 11, Pl. 2. Fig. 8 presents a top, and Fig. 11 an elevated side view of said single geared machine, which in other respects is constructed similar to the double geared before described.

The second group, or combination of parts which are used in connection in said machine, is composed of the follower (V), the railway or slides (W, W) and the check pins (X, X). See Figs. 1 and 2, Plate 1. Said railway is composed of two cast iron gutters, or grooved rails, secured by means of bolts (Y, Y) through their bottoms or otherwise to the inner faces of the top-rails (A A) where they are placed opposite and lengthwise of said frame, with their grooves facing inward, in which grooves the ends of the cross head or follower are loosely fitted and allowed to play freely from end to end of said railway and are secured in any required position, by means of the check pins X, X, through the holes Z, Z, in said rails. See Figs. 7, and 8, Pl. 2, and also the vertical cut section view Fig. 2, Pl. 1, with similar letters of reference. Said follower, is an iron bar extending across said frame with

its outer ends resting in the grooves aforesaid, and is somewhat in the form of the common hay-rake, having a row of teeth or pins *m'* extending lengthwise, and projecting downward from the front corner of its under surface, (corresponding in size, number, and extent, with those in the windlass shaft before described,) as shown in Fig. 5, and also in the vertical cut section view (Fig. 4.) of the top rails or beams of the bed frame A, A, and the guttered cast iron slides W, W, and the check pins X, X, before described.

The third and last group, or train of operative parts in said machine is composed of the friction pulley *a*, the friction band *b*, the binding lever *c*, and retaining beam *d*, the latter of which, is constructed and supported precisely similar to the windlass beam M, except that the pins or comb project in an opposite direction. The friction pulley which is secured upon the outer end of said shaft or beam *d*, and operated by the crank pin *e*, is constructed in the usual manner with slight flanges projecting from the corners of its periphery between which flanges, is closely fitted the friction band *b*, similar to a flat hoop, one end of which is attached by a hinge joint to the end of the binding lever at *f*, and through the other end passes the pin *g*, which forms the fulcrum and center of motion for the binding lever aforesaid, as shown in Fig. 3, Pl. 1 where said pin passes through the bracket *h*, (which strides said lever *c* through which it also passes) into the side rail A. Upon the outside of which said rail, said bracket is secured by the screw bolts *i i*. By suspending the weight *j* upon the end of the lever *c*, the friction band is closed upon the pulley *a*, and retaining beam *d*, which are thereby held in any required position. This group may if desirable be used to advantage on a separate frame, as shown in Pl. 2, Figs. 6 and 9, which present a top and an elevated side view of the same. In connection, and in a line with, said frame, one double geared, and one single geared machine, (before described in group first) are also shown, (in said Pl. 2,) Fig. 7, presents the top, and Fig. 10, the elevated side view of the double geared machine, and Fig. 8 the top and Fig. 11, the elevated side view of the single geared machine.

The operation and mode of using said machine is as follows: In order to form leather belts &c., in such a manner as to render them permanent, and to retain a uniform width, I cut the segments broader than finishing width, lengthwise of the side, excluding most of the loose or flanky portions; a difference will however exist in the sides and ends of the fillets or segments, in order as much as possible to obviate which, I cut the looser parts broadest, and shortest,

forming an obtuse angle at the end or corner of the softest side of said segments. I then punch a line of holes across the ends of the segments, which holes are made to  
 5 correspond with the teeth of the combs on the windlass shaft, and the follower before described. One end of the segment is now fixed upon the pins in the niche of the windlass, and the other being passed over the  
 10 front upper corner of the follower, is secured upon the teeth of the comb before described, as shown in Fig. 8, Pl. 2, in which the band or segment is marked *k*. The follower is now thrown forward as far as the band or  
 15 segment will permit, and secured by the check pins before described. The operators, (one or more) now turn the windlass wheels, until the requisite strain upon the segment is produced, where it is held for a time by  
 20 the pawl J, and ratchet I. See the vertical cut section drawing Fig. 2, Pl. 1. This operation is repeated at intervals until the extension of the fillet or segment is complete. The follower being moved and fastened as  
 25 before described as the extension of the segment will permit. If necessary when one side of the segment requires or will permit of much more extension than the other, the holes on the fully extended side may be  
 30 thrown off from the pins of the follower, or the windlass shaft, or from both, as the required strain may suggest. When the segments have become fully stretched, any number may be united by scarfing and cement-

ing, or otherwise securing their ends together, when they are again returned to the machine, and all of the excess of the segments thus united is wound around the friction roller *d*, see Fig. 2, and is again subjected to the process of stretching by means  
 40 of the two cylinders *d* and *l*, the former being secured in any required position by means of the friction pulley band and lever, and the other by the pawl and ratchet before described. When the band is fully extended  
 45 and set, it is removed from the machine, and the operation is completed.

What I claim as my invention is—

1. The method of making leather bands by stretching the pieces separately when this  
 50 is combined with the stretching of the whole after the pieces are put together as described.

2. And what I claim as my own invention in the above described machine, is the combination of the double or single geared windlass as described in group first, with group  
 55 third, that is, the second cylinder having the retaining beam, friction pulley and weighted lever, as described to be operated and used substantially in the manner and  
 60 for the purposes hereinabove set forth and described, and in combination with these the cross head and railway, as described.

Dated New York November 11th 1845.

WM. KUMBEL.

Witnesses:

JNO. R. CHAPIN,  
 G. W. HUNT.