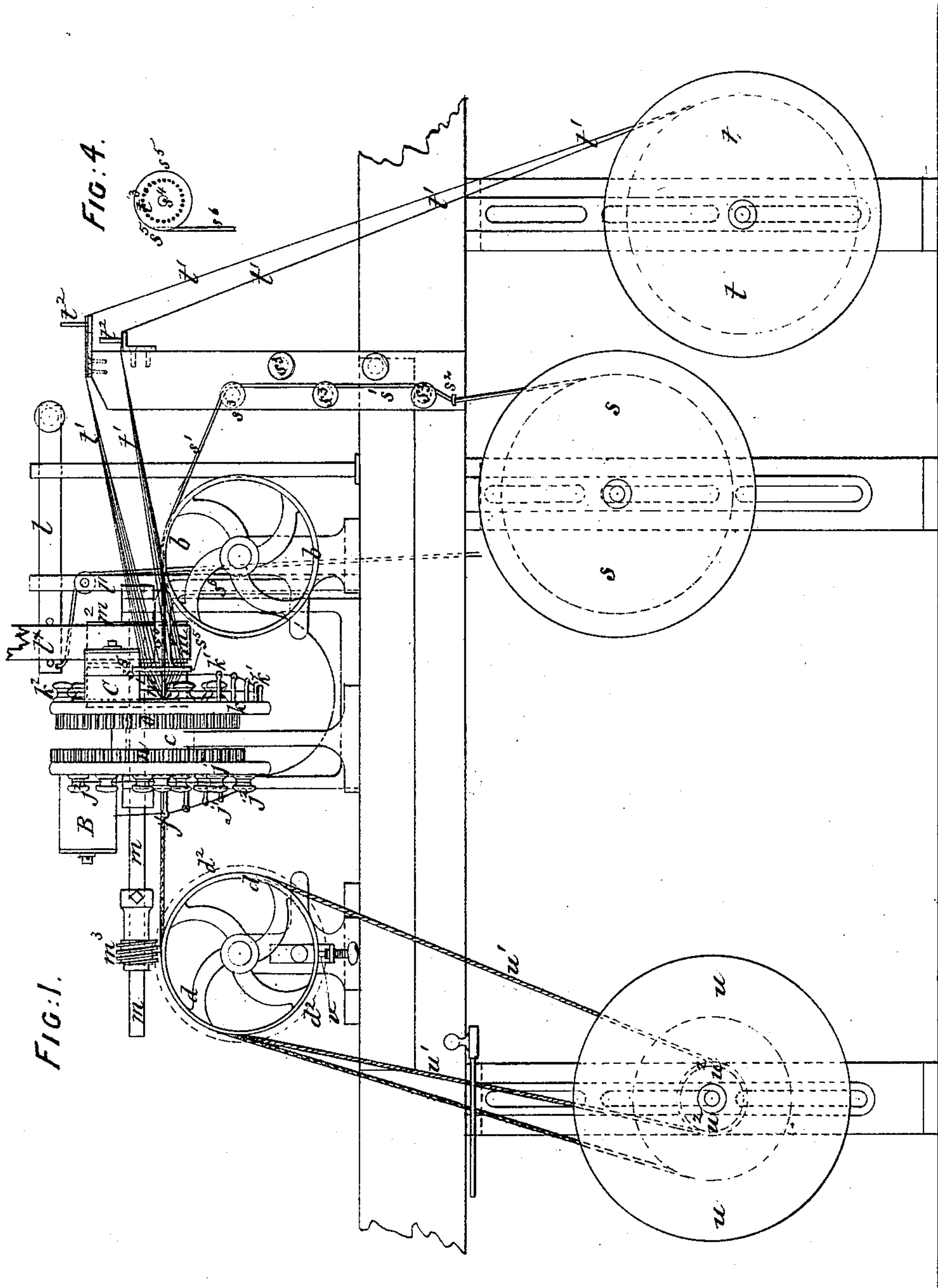


L. BINNS.  
MANUFACTURE OF BANDS, CORDS AND ROPES.  
No. 178,987. Patented June 20, 1876.



Witnesses  
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# UNITED STATES PATENT OFFICE.

LEEDHAM BINNS, OF OAKENSHAW, NEAR BRADFORD, ENGLAND.

## IMPROVEMENT IN THE MANUFACTURE OF BANDS, CORDS, AND ROPES.

Specification forming part of Letters Patent No. **178,987**, dated June 20, 1876; application filed February 8, 1876.

*To all whom it may concern:*

Be it known that I, LEEDHAM BINNS, of the town of Oakenshaw, near Bradford, in the county of York, England, manufacturer, have invented certain Improvements in the Manufacture of Bands, Cords, or Ropes, and in machinery or apparatus to be employed therein, of which the following is a specification:

I form the core of the band, cord, or rope of cheap material, covered with strands of material of any desired quality and color, as heretofore, such core and covering material being, according to one arrangement, drawn off straight from their sources of supply, and having no twist put thereon in the course of manufacture; or the core may have the covering material wrapped or twisted around it.

Over the core produced as above described I, according to my invention, wrap in contrary directions to each other two or more binding threads or cords of any desired material and color.

By these means I am enabled to produce bands, cords, or ropes having the core thereof covered with material of any desired quality and color, or combination of colors, and having binding cords or threads of any desired material and color, or combination of colors, wrapped or twisted around such core in contrary directions to each other, so as to produce highly ornamental effects.

In manufacturing bands, cords, or ropes of the character above described, I employ machinery of a similar character to that described in the specification of Letters Patent of the United States granted to me, dated December 9, 1873, No. 145,386.

In the accompanying drawings, in which similar letters of reference indicate like parts, Figure 1 represents a front view of machinery or apparatus constructed according to my invention. Fig. 2 represents a left-hand end view with some of the parts removed. Fig. 3 represents a right-hand end view with some of the parts removed. Fig. 4 represents a separate face view of plate  $s^5$ , in which guides  $s^4$  and  $t^3$  are formed. Fig. 5 represents, on a larger scale, a portion of a band with part of the covering-strands removed from each end.

I form the center of the core of any desired number of strands of material,  $s^1$ , passing to-

gether from a bobbin or reel,  $s$ , or other source or sources of supply, whence it passes through an eye or guide,  $s^2$ , and around or over tension-knobs  $s^3$ , to the top of the wheel  $b$ , which serves as a guide, and from which it passes to a central eye or guide,  $s^4$ , formed in a disk or plate of metal,  $s^5$ , carried by the bracket  $s^6$ , and I cover the material  $s^1$ , forming the center of the core, by means of any desired or necessary number of strands of material,  $t^1$ , passing from a bobbin or reel,  $t$ , or from another source or sources of supply, through guides  $t^2$ , and thence through eyes or guides  $t^3$ , formed in the plate or disk  $s^5$ , and arranged concentrically around the central eye or guide  $s^4$ , through which the center  $s^1$  of the core passes. The strands  $s^1$  and  $t^1$  are drawn together from their reels or bobbins  $s$   $t$ , or from other sources of supply, and are passed two or more times around the guide-wheel  $d$ , for the purpose of obtaining a firm gripe thereon, and are then passed onto a bobbin or beam,  $u$ , on which the finished article is wound as produced. The bobbin or beam  $u$  receives motion by means of a band,  $w^1$ , passing partly around the pulley  $d$ , and partly around a small pulley,  $w^2$ , fixed on the axis of the bobbin or beam  $u$ , the band  $w^1$  being arranged with a tendency to drive the bobbin or beam  $u$  faster than is required for winding the finished cord, rope, or band thereon, but accommodating itself to the rate at which the band, cord, or rope is produced by slipping upon the pulley  $w^2$ . The ends of thread or other material to form the binding cords or threads of the band, cord, or rope are taken from the bobbins or reels  $B$   $C$ , and passed through the eyes  $j^1$   $k^1$ , fixed in the disks  $j$   $k$ , and thence around the knobs or buttons  $j^2$   $k^2$ , according to the strain desired to be put on the material. From the last of these knobs or buttons  $j^2$   $k^2$  the binding cords or threads are passed through eyes or guides  $j^3$   $k^3$ , and are then fastened to the core of the intended band, cord, or rope. When this is effected the fork-bar  $l$  is, by hand, slid in its bearings in the uprights  $i^2$   $l'$ , so as to shift the driving-strap  $l^x$  onto the driving-pulley  $m^1$ , fixed on the shaft or axis  $m$ . On this shaft or axis  $m$  is also fixed a worm or screw,  $m^3$ , which takes into and gives rotary motion to the toothed wheel  $d^2$ , fixed on the shaft or



axis  $d^1$ , on which shaft is also fixed the guide-wheel  $d$ . On the shaft or axis  $m$  are also fixed toothed wheels  $m^4$   $m^5$ . The wheel  $m^4$  gears directly with and gives rotary motion to the toothed wheel  $n$ , to which the disk  $j$  is fixed, and the toothed wheel  $m^5$ , by means of an intermediate pinion,  $m^6$ , gives rotary motion to the toothed wheel  $o$ , to which the disk  $k$  is fixed, but in contrary direction to that of the toothed wheel  $n$  and disk  $j$ . Thus the binding cord or thread from the bobbin or reel B is wrapped or wound around the core in one direction, and that from the bobbin or reel C is wrapped or wound around the core in the contrary direction. The toothed wheels  $n$   $o$  are mounted on the boss or bearing  $c$ , and the disks  $j$   $k$  are, respectively, screwed or otherwise fixed to the wheels  $n$   $o$ , collars  $c'$ , screwed to the boss or bearing  $c$ , being employed to retain the wheels  $n$   $o$  securely in position on the boss  $c$ . The guides  $j^3$   $k^3$ , at their forked ends, serve to give support to the band, cord, or rope during the wrapping of the binding cords or threads around it, the band, cord, or rope passing between the two parts of such forked ends. By varying the proportions of the screw  $m^3$  and wheel  $d^2$ , the "pitch" of the covering material may be adjusted as desired.

I would here remark that other equivalent modes of giving motion to the disks  $j$   $k$  in contrary directions to each other may be adopted without departing from the nature of my invention.

The several coils of band, cord, or rope, passing around the guide wheel or pulley  $d$ , are prevented from chafing or rubbing against and overlapping each other by means of guides  $v$ , acting in combination with such guide-wheel or pulley  $d$ , as clearly shown at Fig. 2.

If desired, the covering-strands  $t^1$  of the core

may be wrapped or twisted around the core by mounting their guides and source or sources of supply on an axis of motion, and causing them to rotate around the core passing through the central eye or guide at any desired relative speed.

Having thus described the nature of my said invention, and the mode in which I carry the same into effect, I would have it understood that what I claim as my invention is as follows:

1. The rope, band, or cord herein described, consisting of a core,  $s^1$ , colored strands  $t^1$ , and two or more binding threads or cords of any desired color or material wound thereon in contrary directions, as and for the purpose set forth.

2. The combination of the guide-wheels  $b$   $d$ , bobbins or reels  $s$   $t$   $u$ , guides  $s^2$   $s^3$   $s^4$   $t^2$   $t^3$ , wheels  $j$   $k$ , bobbins or reels B C, guides  $j^1$   $k^1$ , tension-knobs  $j^2$   $k^2$ , and guides  $j^3$   $k^3$ , all working together substantially in the manner and for the purpose described.

3. The guide-wheel  $d$ , in combination with guides  $v$ , the band  $u^1$ , pulley  $u^2$ , and bobbin or beam  $u$ , arranged and operating in manner substantially as and for the purposes set forth.

4. The combination, with bobbins  $s$   $t$ , tension-knobs  $s^3$ , guides  $t^2$ , and guide-plate  $s^5$ , of the receiving-bobbin  $u$ , having pulley  $u^2$ , band  $u^1$ , pulley  $d$ , and guides  $v$ , substantially as and for the purpose set forth.

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Witnesses:

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