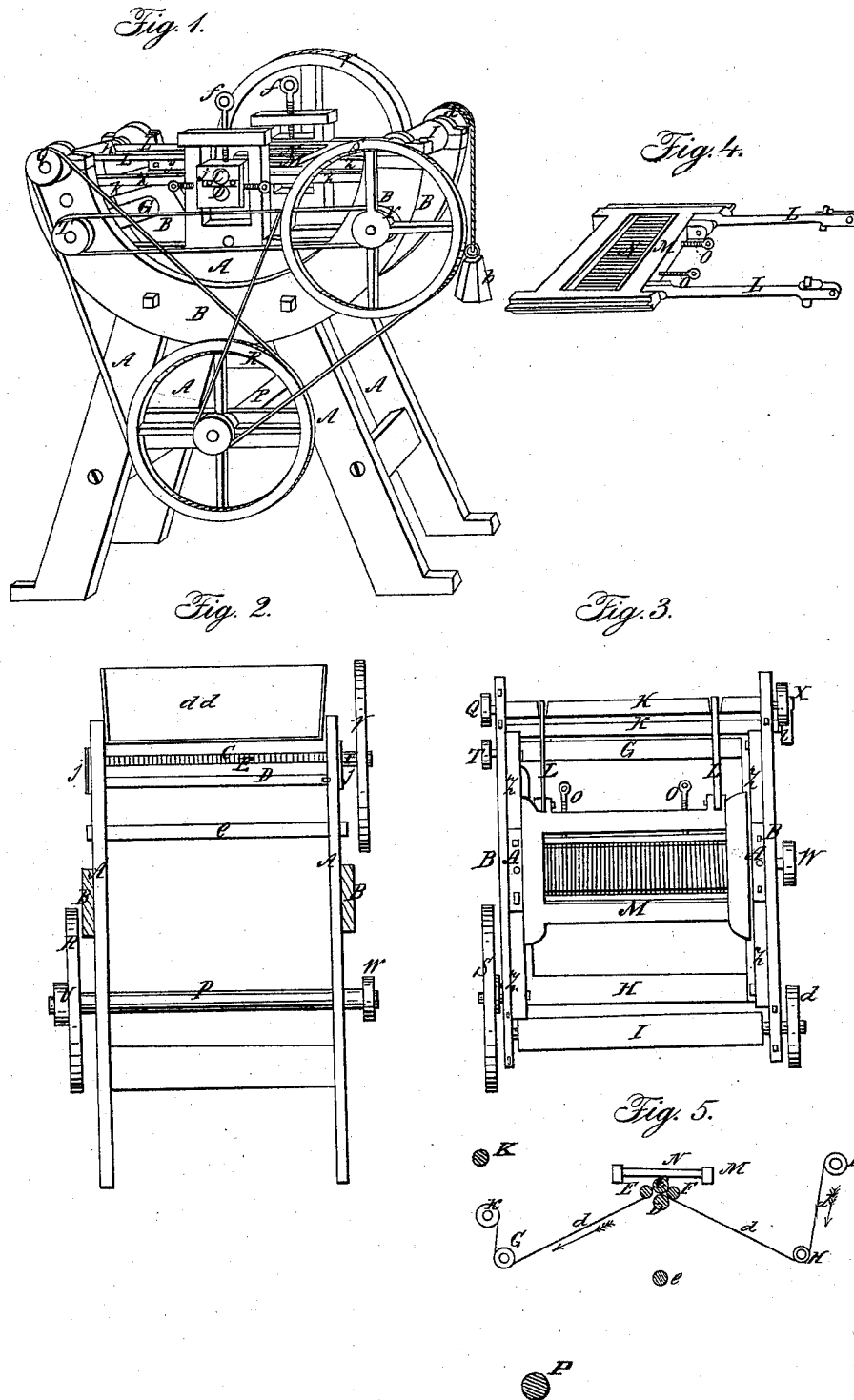


DAY. TYER & HELM.

Cutting Soft Rubber.

No. 4,073.

Patented June 7, 1845.



UNITED STATES PATENT OFFICE.

HORACE H. DAY, OF JERSEY CITY, AND HENRY G. TYER AND JOHN HELM, OF NEW BRUNSWICK, NEW JERSEY.

MACHINE FOR CUTTING INDIA-RUBBER INTO THREADS.

Specification of Letters Patent No. 4,073, dated June 7, 1845.

To all whom it may concern:

Be it known that we, HORACE H. DAY, of Jersey City, Hudson county, New Jersey, and HENRY GEORGE TYER and JOHN HELM, of New Brunswick, Middlesex county, New Jersey, have invented a new and useful improvement in machines for cutting into threads or strips sheet india-rubber for the making of corrugated and other similar kinds of india-rubber goods; and we hereby declare that the following is a full and exact description.

The nature of our invention consists in passing the sheet of india rubber over a roller with or without grooves or channels around it, and cutting it by means of a gang of knives which are made to vibrate rapidly across the knives being kept continually wet by the dripping of water upon them.

To enable others to make and use our invention, we proceed to describe its construction and operation, reference being had to the drawings hereunto annexed and making part of this specification.

In the construction of our machine we have thought best to make the frame of cast iron, as being more likely to be firm and to resist the vibratory motion of the gang of cutters.

Figure 1 is a perspective view; Fig. 2 vertical section; Fig. 3 view from above the machine; Fig. 4 a gang of knives or cutters; Fig. 5 a diagram showing the relative position of the different principal and the passage of the sheet of india rubber through the machine.

The sides of the frame are made in two parts, A, serving for the legs and also at top for the support of the center rollers. The semicircular part, B, is made in that shape for the convenient arrangement of the various rollers over and around which the sheet passes. The roller at the top, in the middle of the machine, marked, C, is that over which passes the sheet of india rubber to be cut. It is generally made of iron or steel, but may be made of wood well polished and boiled in oil, but iron or steel is preferable as it should be made as small as possible that but little of the sheet may be presented to the knives at a time. In this roller, C, grooves or channels are turned out. They are made of such distance apart as is

required for the width of the thread—say a tenth or twelfth of an inch. Beneath this roller, C, is placed another, D, of the same size to support it and prevent its springing in consequence of the tension of the sheet of india rubber. On each side of C and D, is a small iron roller, the two being marked, E and F. They are for the purpose of pressing the sheet firmly against the roller, C, and they are made to revolve only by the movement of the sheet against them. At each side of these four at a little distance is another roller—the two marked, G and H. They are made to revolve by bands which regulate their movement so that the one, H, will let on the sheet as fast as it is to be cut and the other, G, will take it off with a little tension so that the sheet will never yield, while being cut, upon the surface of the roller, C. There are two other rollers with which the sheet is connected, I, upon which it is wound gives it off as fast as required, being held by the friction of a cord and weight, and pulley at the end of the roller, and K, upon which the threads are wound up by cord and weight.

The main driving shaft is K, from which motion is given to the whole machine. Either at the end or between the connecting rods, L, a suitable fast and loose pulley, X, is attached on which runs the driving band. On one end of the shaft, K, is a pulley, Q, over which passes a band and around a large pulley, R, connected with a shaft, P, which by means of its pulleys is intended to reduce the speed of the various rollers with which it is connected, to wit, G and H, and C.

The gang of knives is constructed of very thin blades of steel, having notches cut in each end, so that a plate of iron fitting in the notches may be secured to one side of the frame, M, and sundry plates fitting into notches at the other end of the knives so that each screw may tighten by means of one of the plates, say four or five of the knives. The blades are kept separate by plates of metal between them of the appropriate thickness. The frame containing the gang of knives is moved in its vibratory motion, by the cranks or eccentrics (upon the driving shaft, K,) by means of the connecting rods, L.

The rollers, G and H, have no other office

than to deliver the sheet at a given speed to the cutters and draw it off at slight tension. The advantage of which is that it overcomes the tendency of the sheet to wrinkle while
5 being cut. Their position is not of special importance, so that they create sufficient friction upon the sheet (uncut and cut) to regulate the movement. The same result is attainable by two rollers upon each side be-
10 tween which the sheet might be held, but as this plan would require four rollers instead of two, the plan which is represented in the drawing is preferred.

The water is let upon the knives to make
15 them cut smoothly from a trough, Fig. 2, *a a*, placed above.

What we claim as our invention and desire to secure by Letters Patent is—

The combination of the gang of knives or cutters, N, with the roller, C, for cutting the
20 threads or strips according to the principle above described.

HORACE H. DAY.
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JOHN HELM.

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Witnesses as to Tyer and Helm:

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