(No Model.) 3 Sheets—Sheet 1.

E. M. LAMB & E. BALES.

MACHINE FOR MAKING TOOTHPICKS.

No. 588,645. Patented Aug. 24, 1897.

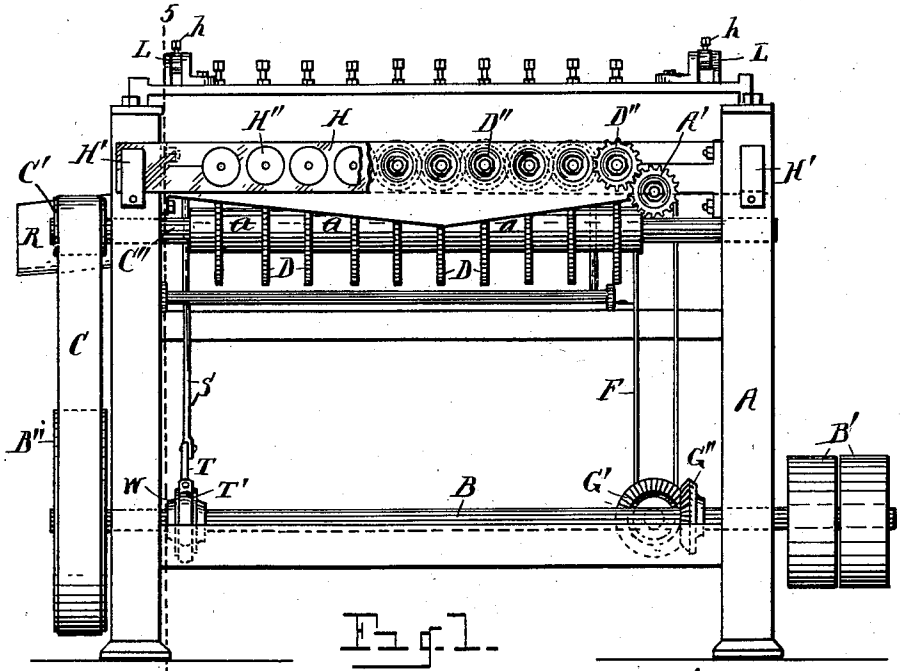


Fig. 1.

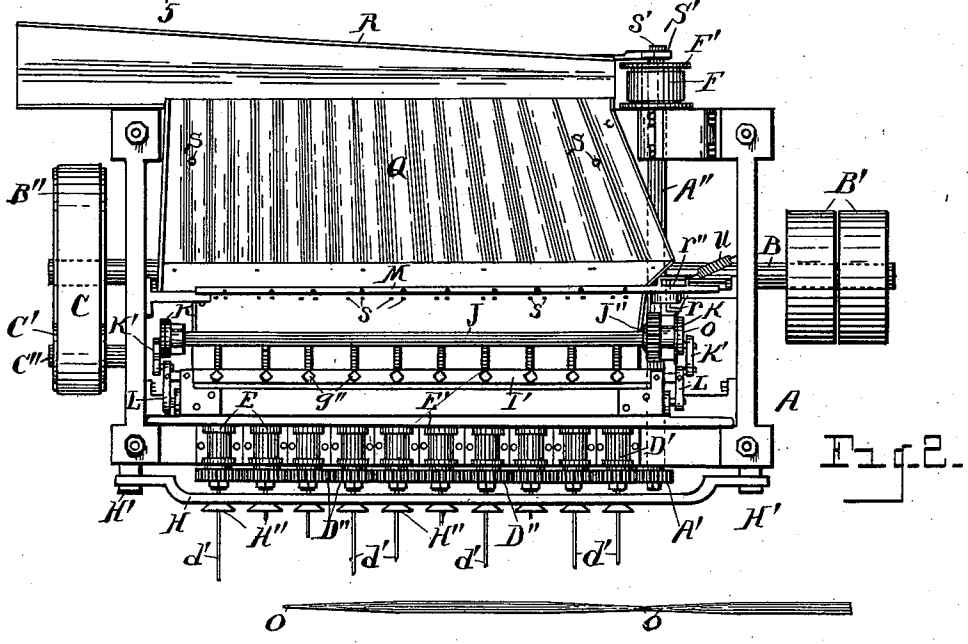


Fig. 2.

Fig. 12.

WITNESSES

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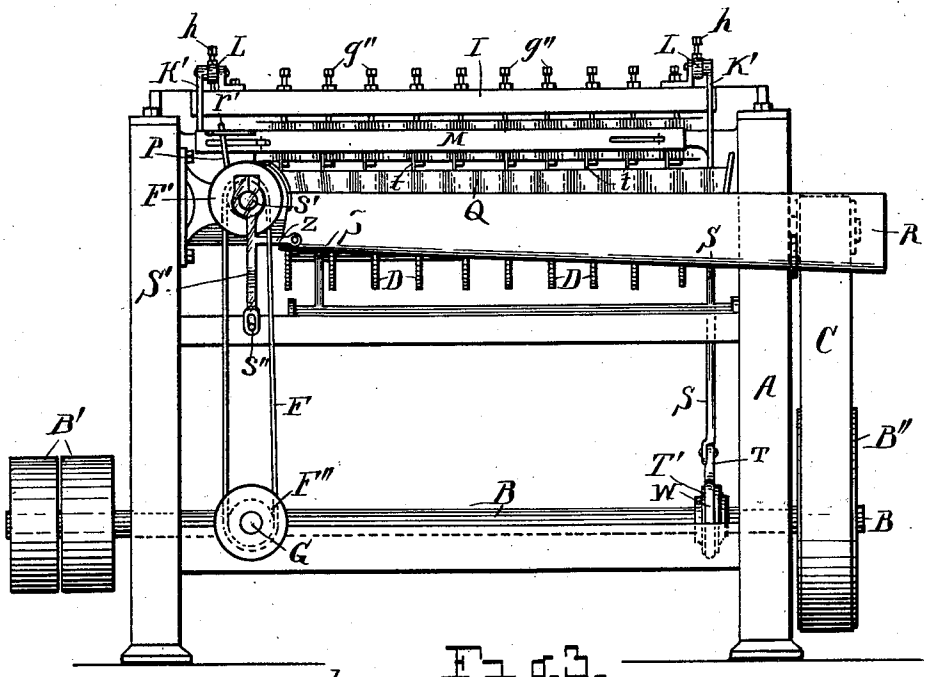


Fig. 3.

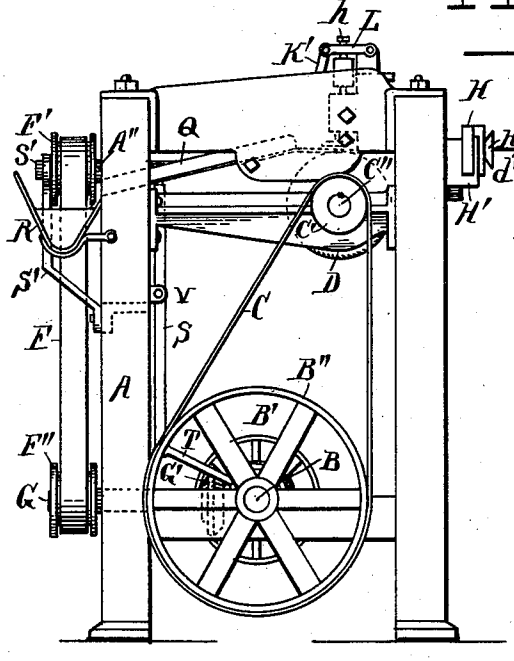


Fig. 4.

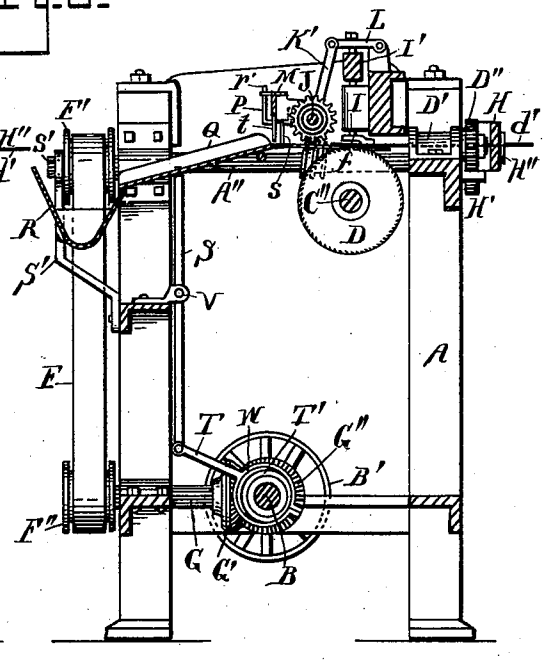


Fig. 5.

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MACHINE FOR MAKING TOOTHPICKS.

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Fig. 6.

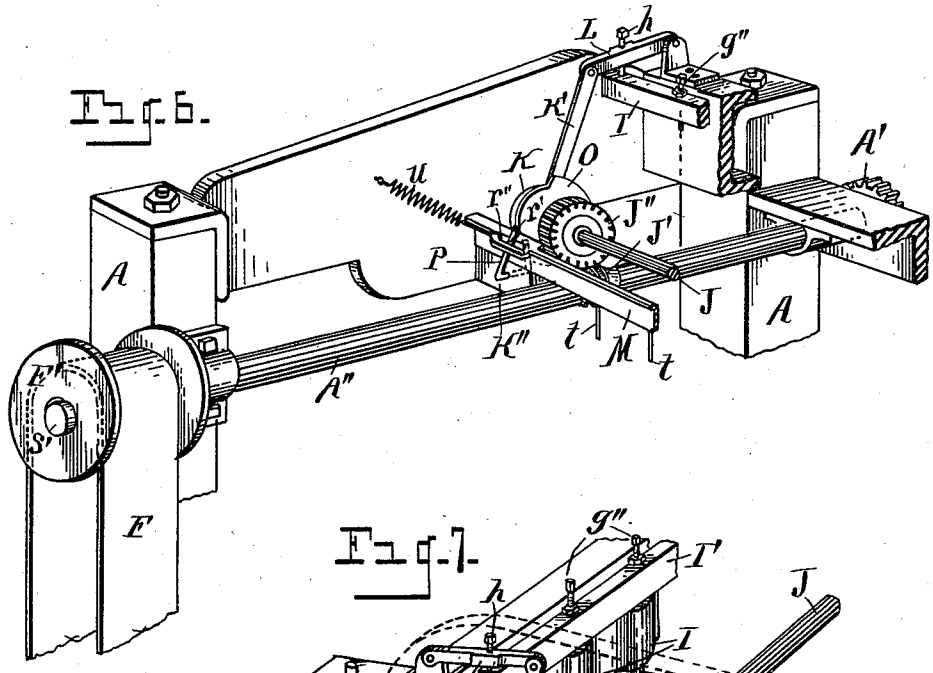


Fig. 7.

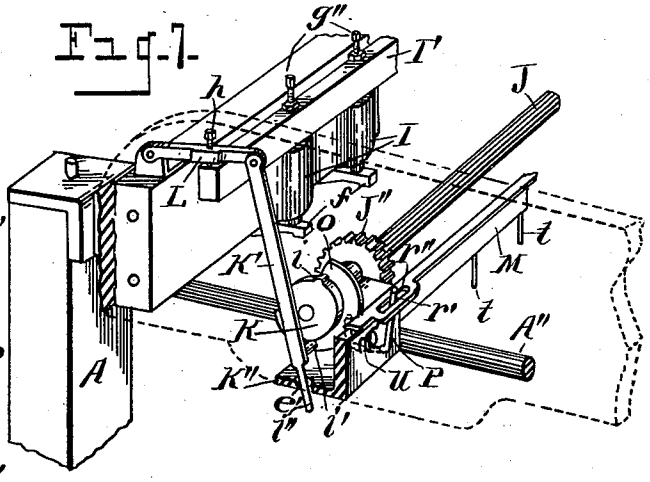
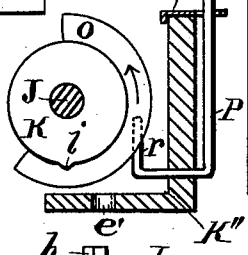


Fig. 8.



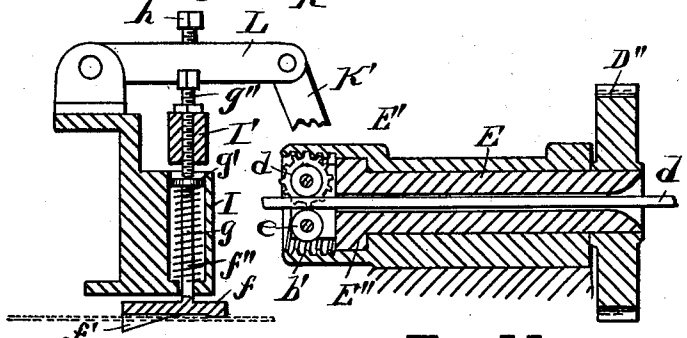
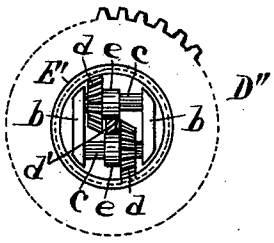


Fig. 9.

Fig. 10.

Fig. 11.



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UNITED STATES PATENT OFFICE.

EDWARD M. LAMB AND EMMOR BALES, OF CLAYTON, MICHIGAN.

MACHINE FOR MAKING TOOTHPICKS.

SPECIFICATION forming part of Letters Patent No. 588,645, dated August 24, 1897.

Application filed February 4, 1897. Serial No. 621,927. (No model.)

To all whom it may concern:

Be it known that we, EDWARD M. LAMB and EMMOR BALES, citizens of the United States, residing at Clayton, in the county of Lenawee, State of Michigan, have invented certain new and useful Improvements in Machines for Making Toothpicks; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to machines for making toothpicks; and it consists in the construction and arrangement of parts hereinafter fully set forth and claimed.

The object of the invention is to provide a machine for the manufacture of hard-wood toothpicks in which the arrangement is such as to produce a round-turned pick pointed at both ends of superior quality, at the same time effecting economy in the manufacture of the picks because of the rapidity with which they can be made, and for the further reason that they can be made from any kind of hard-wood lumber with but little waste. This object is attained by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of our machine for manufacturing toothpicks, a portion of the cross-piece carrying the feeding-funnels being broken away to show the openings in the series of feeding-heads. Fig. 2 is a plan view of Fig. 1. Fig. 3 is a rear elevation of the machine. Fig. 4 is an end elevation thereof. Fig. 5 is a vertical transverse section as on line 5 5 of Fig. 1. Fig. 6 is an enlarged detail in perspective of a portion of the operative mechanism, parts being broken away. Fig. 7 is also an enlarged detail in perspective of some of the parts shown in Fig. 6. Fig. 8 is an enlarged detail, partly in section, of one of the rotary cams and the pivoted arm actuated thereby. Fig. 9 is an enlarged detail, partly in section, of the mechanism for holding the strands from which the toothpicks are formed in engagement with the rotary cutters. Fig. 10 is a horizontal section through one of the series of feeding-heads which feed the strands through the machine. Fig. 11 is a front elevation of said head. Fig. 12 is a view of the completed toothpick.

Referring to the letters of reference, A designates the frame of the machine, which may be of any suitable construction. Crossing the bottom of the frame longitudinally and journaled in suitable bearings therein is the main shaft B, carrying on one end the drive-pulleys B′. On the opposite end of said shaft is a large pulley B″, which is connected by the belt C with the pulley C′ on the shaft C″, journaled in the upper part of said frame and carrying a series of circular cutters D, which are spaced a proper distance apart on said shaft by means of interposed collars *a*.

In the machine herein shown there are ten of the rotary cutters D, and corresponding with said cutters, but located above and in advance thereof, is a series of rotary feeding-heads D′, which heads are journaled in the frame of the machine and which are adapted to feed the strands or splints from which the toothpicks are formed longitudinally over the rotary cutters and revolve them rapidly at the same time. These feeding-heads are shown more clearly in Figs. 10 and 11 and consist of a short hollow rotary shaft E, journaled in an inclosing case which embraces said shaft and is provided at its inner end with an enlarged portion E′, which receives the enlarged outer end E″ of said shaft E. Mounted upon the enlarged end of said shaft are the opposed studs *b*, which project axially of the shaft. Journaled between said studs are the opposed spindles *c*, which carry on their opposite ends the beveled gears *d* and which are provided with the registering rollers *e*. The inner wall of the enlarged end portion E′ of the case receiving said shaft E is provided with an internal thread *b*′, which meshes with the teeth of the beveled gears *d*, whereby a rotation of the hollow shaft E will cause the gears *d* to be driven in opposite directions, thereby turning the feed-rollers *e* and causing them to feed the splint *d*′ longitudinally between their opposed peripheries, at the same time causing said splint to revolve around its longitudinal axis by means of the rotation of the hollow shaft through which it passes, said shaft being driven by a gear D″, mounted on the outer end thereof.

These feeding-heads D′ are arranged in a horizontal plane, as shown in Fig. 2, and are driven by the train of engaging gears D″, the angle of the threads b' in the enlarged end of the case receiving the teeth of the gears of the feeding-heads being alternately reversed from right to left hand threads, so that the feed-rollers in all of the feeding-heads will be so rotated as to carry the splints or strands d' in the same direction—that is to say, into the machine.

The train of gears D″ of the feeding-heads is driven through the gear A′, (see Figs. 1 and 2,) which is mounted on the outer end of a counter-shaft A″, journaled in the upper portion of the frame and driven by a belt F, passing over the pulley F′ thereon and over the pulley F″ on the end of the short lower shaft G, which shaft G is driven through the engagement of the beveled gear G′ thereon with a like gear G″ on the main shaft B.

Crossing the front of the machine is a bar H, whose ends are detachably supported in brackets H′ on the machine-frame. Located in said bar is a series of funnels H″, which stands adjacent to and in line with the opening in the hollow shaft E of the feeding-heads and serves to assist the operator in guiding said splints into said heads in the operation of feeding the machine. While we have shown and described the specific feeding mechanism herein set forth for feeding the strands of wood to the machine, it is evident that we may employ any suitable means for feeding the strands longitudinally and rotating them at the same time without departing from the spirit of our invention.

Located in the rear of the rotary feeding-heads, in line with the aperture therethrough and directly over the rotary cutters D, is a series of guide-shoes f, said shoes having a way formed between depending flanges f' in their under faces adapted to receive the splints from the feeding-heads and hold them in engagement with the rotary cutters, as shown in Fig. 5. These shoes are provided with a vertical stem f'', which projects upward into a suitable housing I in the frame of the machine and is environed by a coiled spring g, which is confined between the base of said housing and a collar g' on the upper end of said stem, (shown more clearly in Fig. 9,) by which arrangement said feed-shoes may be depressed against the action of the springs g, but will be returned by said springs when the depressing force is removed.

Extending longitudinally of the machine adjacent to the upper end of the housings I, containing the stems of the series of guide-shoes, is a cross-head I′, having a series of set-screws g'', which screws pass downward through said cross-head and engage the collars g' on the stems of the guide-shoes. This cross-head is common to all the set-screws g'', each one of which is adapted to bear upon the collar g' on the stem of the corresponding guide-shoe, and when said cross-head is depressed all of said shoes are simultaneously carried downward thereby and are returned by their respective springs g when said cross-head is raised. This cross-head I′ is depressed through the medium of the mechanism shown more clearly in Figs. 6 and 7, in which there is shown a longitudinal shaft J, which is driven by a worm J′ on the cross-shaft A″, which meshes with a gear J″ on said shaft J. Mounted on each of the outer ends of said shaft J is a cam-wheel K, having a high point i thereon. Engaging the periphery of said cam-wheel K is an antifriction-roller i', which is journaled to an inclined arm K′, the lower end of which is reduced, as at i'', and passes through a guide-opening e' in the plate K″ of the frame. The upper end of said arm is pivoted to one end of a lever L, the opposite end of which is pivoted to the frame of the machine and which is provided at its longitudinal center with an adjusting-screw h, which passes therethrough and engages the upper edge of the cross-head I′. It will now be seen that by the rotation of the shaft J the high point i of the cams K on the ends thereof will engage the antifriction-rollers i' of the arms K′ and throw said arms slightly downward, depressing the cross-head I′ and carrying the series of guide-shoes f' downward closer to the rotary cutters, whereby the splints carried by said shoes are forced downward onto the rotary cutters D, which, cutting more deeply into said splints, produce the tapered points o thereon. (Shown in Fig. 12.) It will be understood that this depression of the series of splints through the actuation of the cross-head I′ occurs quickly and that at each depression the adjacent ends of two consecutive picks are pointed, as shown at the center of Fig. 12. This operation of depressing the shoes is so timed with the feeding mechanism as to produce picks of the required length, which may be varied as desired.

As will be seen on referring to Fig. 12, the operation of pointing the adjacent ends of the picks does not sever the strand from which they are formed. To break the picks apart after the operation of pointing them, they are caused to pass between a series of pins s, (see Fig. 2,) which pins are set in the table of the machine and adjacent to which is located a horizontally-reciprocal bar M, having depending fingers t, which are adapted to engage the strands of the pointed picks as said bar reciprocates at right angles to the movement of said strands and break them off at their reduced point between said pins s. The horizontal reciprocation of the bar M is accomplished by means of a mutilated disk O, mounted on the shaft J and having a segment of its periphery cut away. Lying against the face of this disk is the right-angled end r of the rocking arm P, which is journaled in the upright portion of the plate K″ of the frame and whose upper end r' engages in the slotted opening r'' in the end of said bar M. At-

tached to the end of said bar is a coiled spring *u*, which serves to return said bar when it has been carried in the opposite direction by the rocking arm P. As the mutilated disk O rotates the right-angled end *r* of the rocking arm P will drop over when encountering the open segment of said disk, permitting the spring *u* to draw the bar M longitudinally. A further rotation of said disk O will cause the full face thereof to pick up the end *r* of said rocking arm, thereby swinging the upper end thereof inward and moving said bar M in the opposite direction, imparting to said bar, through the rotation of said disk O, a horizontally-reciprocal motion, whereby the continuous strands of toothpicks are broken off, as before described.

As the toothpicks are broken off or separated by the reciprocating bar M they fall onto an inclined corrugated table Q, down which they travel to a spout R, located below the lower edge of said table. To facilitate the passage of the toothpicks down said inclined table, said table is caused to vibrate by means of a lever S, (see Figs. 1 and 2,) which is pivoted at *v* to the frame of the machine and engages at its upper end in a socket in the under face of said table, being pivoted to a pitman T, extending from an eccentric-strap *w*, which embraces an eccentric T′, fixed upon the main shaft B, whereby as said shaft rotates the lever F oscillates, imparting a vibrating motion to the table Q.

The spout R, into which the toothpicks fall from the inclined table Q, is also caused to vibrate, so that the picks may be caused to pass downward therein and discharge from the lower end thereof. This vibratory movement of said spout is imparted through the means of a pin *s*′, which is placed slightly eccentric in the pulley F′ and to which is journaled the upper end of the arm S′, whose lower end is loosely pivoted at *s*″ to the frame of the machine. Projecting from said arm is an extension *z*, which is attached to the upper end of the spout R, whereby as the pulley F revolves a short vibratory movement is imparted to said spout.

It will now be understood that by means of the machine described and shown herein hardwood toothpicks may be formed which are turned and pointed as shown in Fig. 12. The strands from which the toothpicks are made being fed into the machine and rotated rapidly as they are fed, the bodies of said picks are thereby reduced to a cylindrical form as they are carried over the rotary cutters, and by means of the intermittent depression of the guide-shoes a long tapering point *o* is formed on the ends of the picks by said shoes carrying said strands downward upon said cutters at intervals. The rapid rotation of the strands from which the picks are formed, together with that of the cutters D, turns the surface of the picks to a smooth and rounded form and evenly and perfectly tapers the ends thereof, producing toothpicks of superior quality because of their perfect formation and of their strength and durability.

Having thus fully set forth our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a machine for making toothpicks, the combination of the rotary feeding-head for rotating and feeding the strand through the machine, the rotary cutter in line with said head, means involving a guide for carrying the strand over said cutter in contact therewith, and for intermittently depressing the rotary strand onto the cutter to form the taper on the end of the pick.

2. In a machine for making toothpicks, the combination of the rotary head adapted to rotate and feed the strand from which the pick is formed, a rotary cutter located in the path of said strand and rotating in the plane of the longitudinal axis thereof, means for holding said strand in contact with said cutter and intermittently depressing said strand onto said cutter.

3. In a machine for making toothpicks, the combination of the rotary feeding-head adapted to rotate the strand and carry it forward through the machine, the rotary cutter located in the path of said strand standing parallel therewith and turning in the direction of the longitudinal axis thereof, means for holding said strand in contact with the rotary cutter and intermittently depressing the strand thereon to form the tapered point of the pick, and means for separating the strand at the minor axis of said taper.

4. In a machine for making toothpicks, the combination of the feeding-head adapted to rotate and feed the strand longitudinally, the rotary cutter located in the path of said strand and turning in the direction of the longitudinal axis thereof, means for holding the strand firmly in contact with said cutter, and bringing said strand and cutter nearer together at regular intervals to produce the tapered ends of the picks.

5. In a machine for making toothpicks, the combination of the rotary feeding-heads for feeding and rotating the strands, the rotary cutters located in the path of said strands, the guide-shoes embracing said strands and located over said cutters, the cross-head carrying said guide-shoes, and means for intermittently depressing said cross-head to carry downward said shoes and force the strands downward onto said cutters.

6. In a machine for making toothpicks, the combination of the feeding-heads for rotating and feeding the strands longitudinally, the rotary cutters located in the path of said strands, the series of spring-actuated guide-shoes adapted to receive said strands and hold them in contact with said cutters, the vertically-movable cross-head, adjusting-screws in said cross-head engaging the stems of the guide-shoes, and means for depressing said cross-head.

7. In a machine for making toothpicks, the

combination of the feeding-heads adapted to rotate and feed the strands longitudinally, the rotary cutters located in the path of said strands and adapted to turn said strands round, means for depressing said strands onto said cutters at intervals to reduce the transverse diameter of said strands by forming meeting conical points united at their outer apexes, fixed pins in the table of the machine between which said strands pass, the horizontally-reciprocal bar having depending pins which engage said strands and separate the picks at their united points as set forth.

8. In a machine for making toothpicks, the combination of the rotary feeding-heads adapted to rotate and feed the strands from which the toothpicks are formed, the cutters in line with said heads, a vertically-movable cross-head carrying the guide-shoes which receive said strands, the cross-shaft J, the cams on the ends of said shaft, the arms engaging said cams, and the levers pivoted to said arms and engaging said cross-head.

In testimony whereof we affix our signatures in presence of two witnesses.

EDWARD M. LAMB.
EMMOR BALES.

Witnesses:
B. R. KESSLER,
J. B. KESSLER.