

No. 647,876.

Patented Apr. 17, 1900.

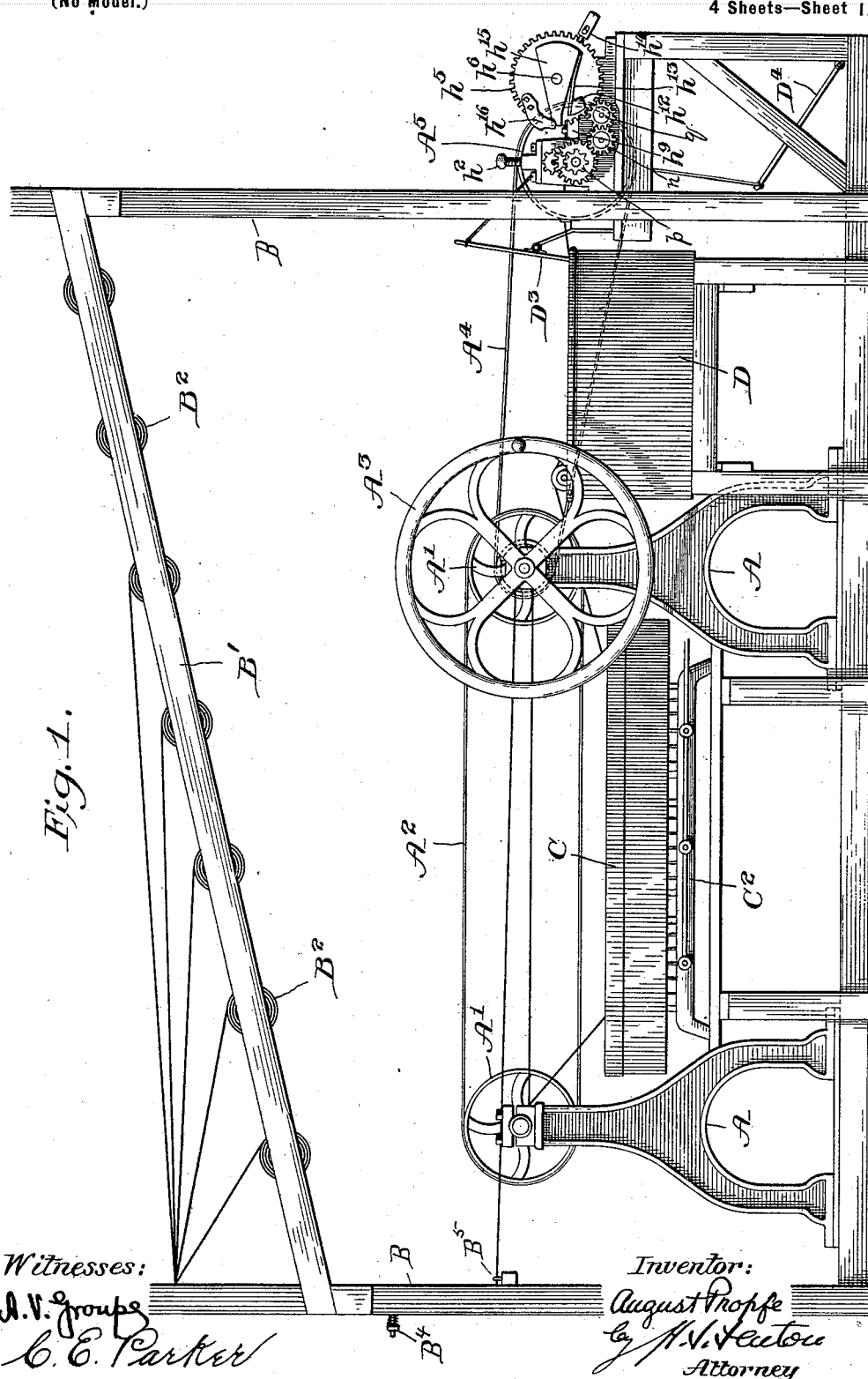
A. PROPFE.

MACHINERY FOR MANUFACTURING WAXED TAPERS OR COATED STRINGS.

(No Model.)

(Application filed Sept. 9, 1899.)

4 Sheets—Sheet 1.



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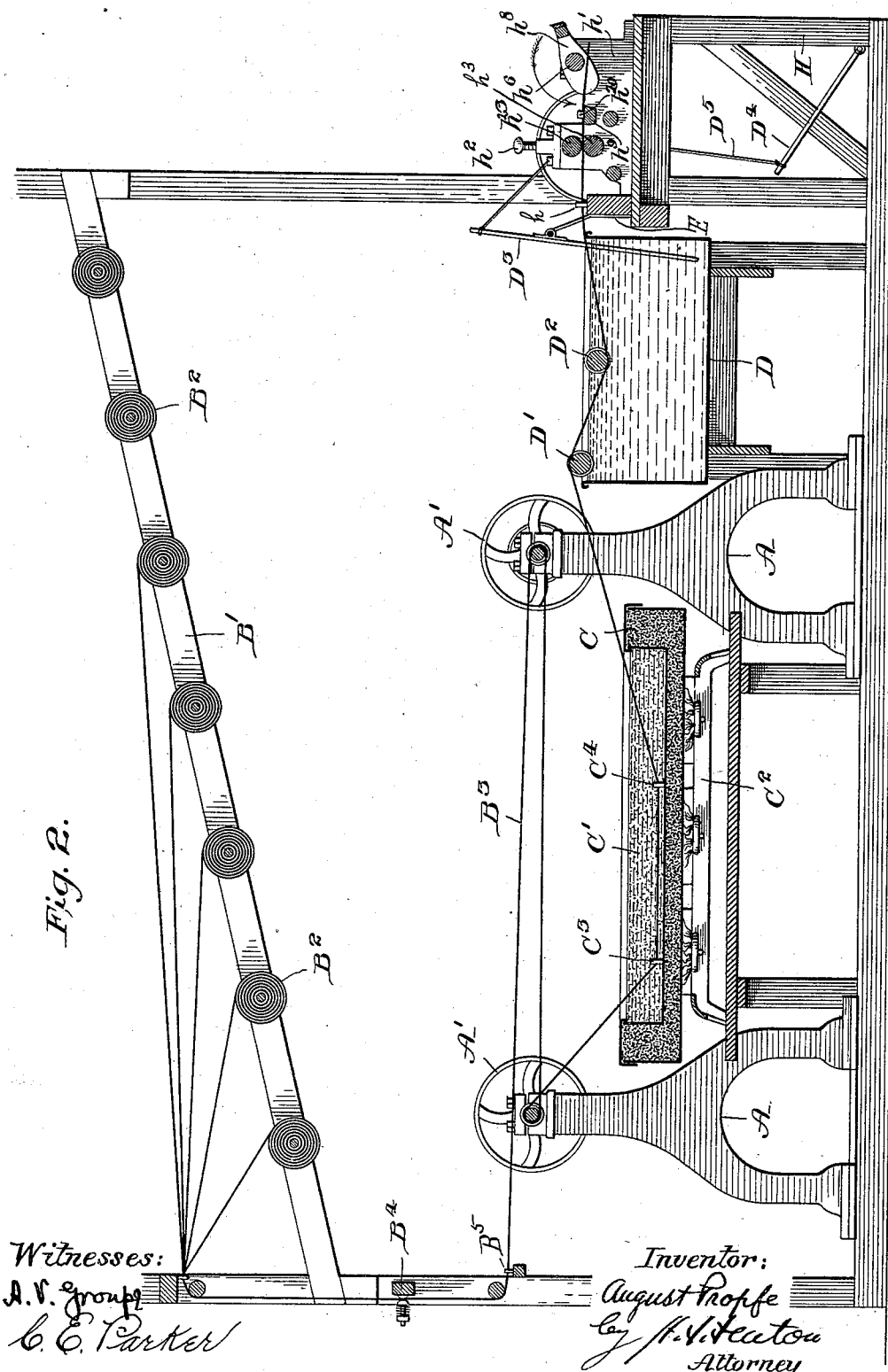
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C. E. Parker

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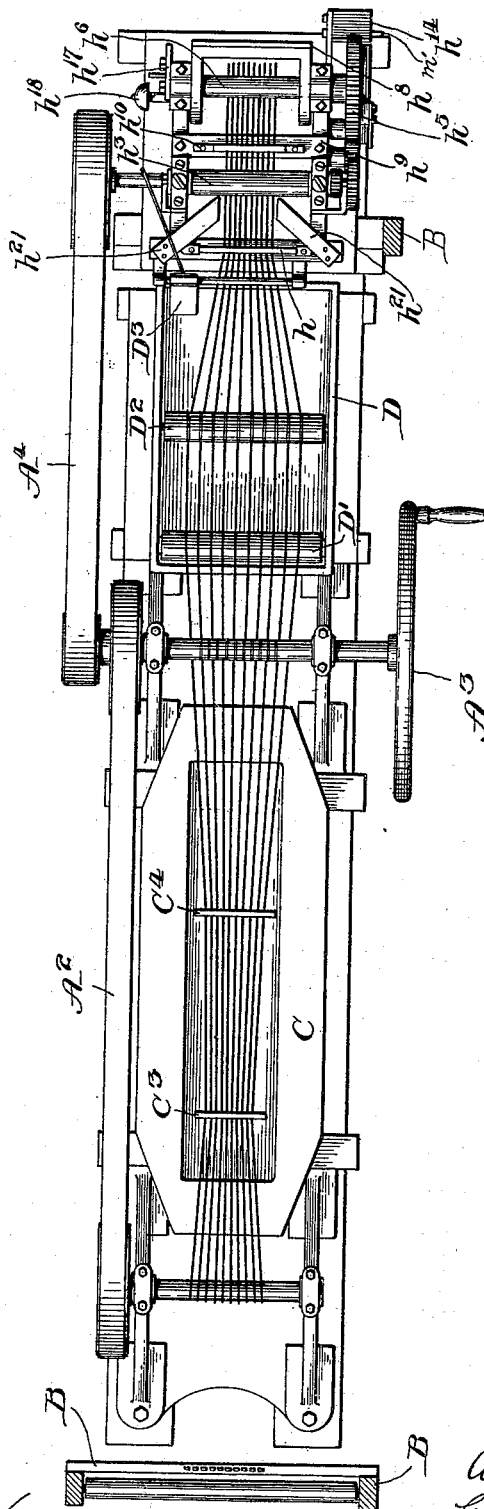
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4 Sheets—Sheet 3.

Fig. 3.



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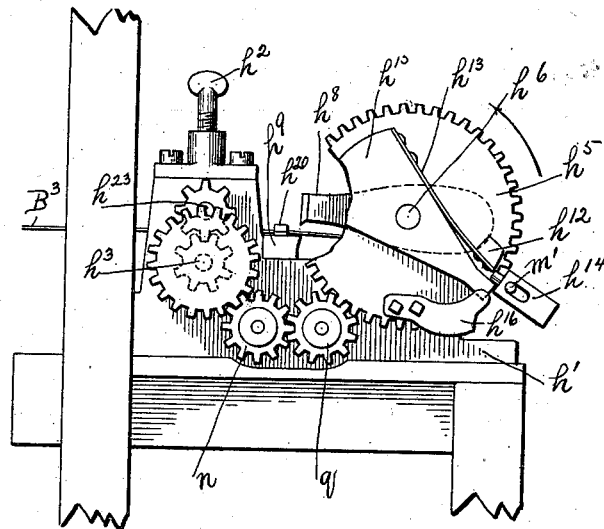


Fig 4.

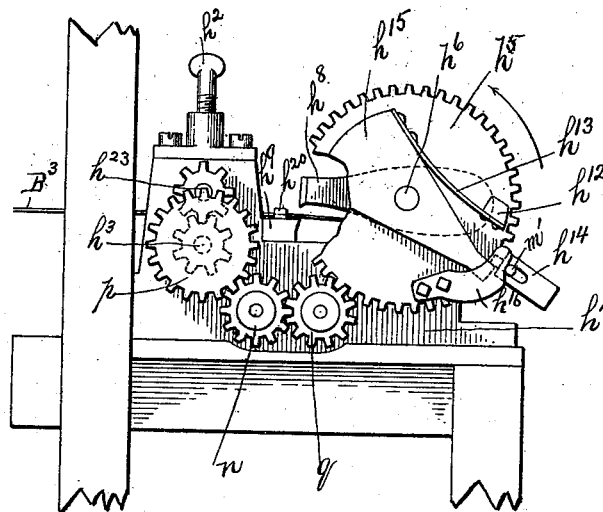


Fig 5.

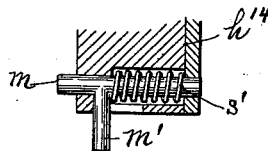


Fig 6.

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UNITED STATES PATENT OFFICE.

AUGUST PROPFE, OF PHILADELPHIA, PENNSYLVANIA.

MACHINERY FOR MANUFACTURING WAXED TAPERS OR COATED STRINGS.

SPECIFICATION forming part of Letters Patent No. 647,876, dated April 17, 1900.

Application filed September 9, 1899. Serial No. 729,949. (No model.)

To all whom it may concern:

Be it known that I, AUGUST PROPFE, a citizen of the United States, residing in the city of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Machinery for Manufacturing Waxed Tapers or Coated Strings, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to mechanism for manufacturing waxed tapers and coated strings, and has for its object to simplify and to perfect the machinery for manufacturing such articles and to cheapen and improve the product thereof.

To these ends it consists of improved means for feeding in the lamp-wick or other string used as the starting material, improved means for applying the waxing composition, improved devices for tensioning and guiding the strings, improved devices for cooling the strings after coating and delivering the same to the cutting devices, and improved mechanism for cutting the finished tapers or strings in predetermined lengths, the several improved mechanisms constituting in combination a unitary apparatus whereby the raw or uncovered strings are fed, guided, tensioned, coated, cooled, delivered to, and cut by the cutting devices by one continuous operation.

Referring to the accompanying drawings, Figure 1 is a side elevation of the complete apparatus; Fig. 2, a vertical section taken longitudinally through the center of Fig. 1, and Fig. 3 is a plan view of the machine. Fig. 4 is an enlarged side elevation of the cutting mechanism detached. Fig. 5 is a similar view with the parts in another position. Fig. 6 is a detail of the spring-pin.

Referring to said drawings, A A represent standardssupporting the pulley-wheels A' A', the shafts of which constitute pulling-rolls. Power is conveyed from one to the other of them by means of an endless belt A². The shaft of one of said pulleys is driven by means of a hand driving-wheel A³. The shaft of the same pulley is connected by another endless belt A⁴ with a rear pulley A⁵. The shaft of the

pulley A³ carries gears which connect through intermediate gearing with gears h⁵ on a shaft carrying one member of the cutting devices.

Two frames B B are set up at or near each end of the machine and support an inclined bar B', on which the rolls B² of candle-wick are mounted. These rolls unwind by pulling on the candle-wick, which is let off through a spring tension device B⁴, so as to let off the same uniformly, and the wick then passing through a guide-rod B⁵, having perforations in it equal to the number of strands of candle-wick employed on the machine. From this guide-rod the candle-wick is led to the roller-shaft of the farthest pulley-wheel A', around the same and back to and around the roller-shaft of the nearest pulley-wheel A', and thence to perforated guide-racks C³ C⁴ in the waxing-pan. This course of the candle-wick from the let-off rolls B² to the waxing-pan C is clearly indicated in the drawings. Arranging a pair of shafts rotated by pulleys A' A' and carrying the candle-wick around them causes said shafts to operate as pulling-rolls to unwind the candle-wick and deliver the same to the waxing composition in a taut condition, and hence without kinks, and this pulling and delivery of the candle-wick is uniform, owing to the guiding device B³ and the tension mechanism B⁴ between said guiding device and the let-off rolls B².

C is a pan of metal having a false bottom, the same being filled with sand, and above the said false bottom is maintained a body of melted wax or other coating composition. Below the pan C is arranged a gas-stove C², which heats the sand and which in turn gives a uniform temperature to the wax. The pan contains a guide-rack C³ with holes in it, through which the wick passes. A second guide-rack C⁴ is also placed in the pan, the holes therein being slightly wider apart than in the other rack, so as to separate more fully the waxed threads. From waxing-pan C the waxed threads pass to a pan D, filled with cold water. This pan has two guide-rollers D' D² with annular grooves to separate and guide the waxed strings. This pan is to set the wax by cooling. D³ is a stirring-blade

operated by a treadle D^4 through a band D^5 to stir up the water in the pan to keep its temperature even.

In the rear of the apparatus is a table H, on which is first mounted a wooden bar E, on which is a metal guide-bar h , having holes in it through which the waxed strings pass to the cutter. The table H supports cutting mechanism operating to cut off the strings into definite lengths—say twelve inches each. The cutting mechanism is shown in Figs. 4, 5, and 6 and in side elevation in Fig. 1, and Fig. 2 is a longitudinal vertical section, h' being the rear plate supporting the shafts of the gears.

A^5 is a pulley-wheel driven by the pulley-belt A^4 , and it carries a roller h^3 , which coöperates with an upper non-rotating roll h^{23} , which constitute drawing-rolls operating to draw the waxed strings through the cooling-pan and deliver them to the cutting device. An adjusting-screw h^2 is supplied to bring the rolls h^3 h^{23} nearer together or farther apart to give more or less pressure on the waxed threads as these rolls draw the thread forward through the pan D and from the pan C. The rolls h^{23} are iron covered with textile covering, preferably electric insulation-tape, wound around the rollers, this tape being saturated with a rubber solution, which makes it more or less sticky. The end of the roller h^3 is supplied with cog-gearing p , which meshes with connecting-cogs n and q , which in turn mesh with and drive cog-gearing h^5 on the end of shaft h^6 , on which the movable member of the cutting-shears is mounted and by which it is actuated.

The cutting mechanism, by which certain lengths of the taper are cut as it is being coated, cooled, and finished, consists of the following:

In Figs. 4 and 5 the passage of the taper or waxed cord is indicated at B^3 as it is being drawn from the waxing and cooling pans by the drawing force of the rolls h^3 h^{23} , which also forcibly deliver it to the cutting device, said cutting device being actuated in unison therewith by means of the train of gears p n q , referred to. The cutting device is constructed to operate by a shearing action, the fixed member h^9 receiving the cord or taper from the rolls on its top surface, where it is held and guided by the perforated plate h^{20} . The cord is cut against the edge of the fixed knife h^9 by the rotating knife h^8 in the following manner: Fixed to the shaft h^6 is the knife h^8 , while loosely mounted thereon is the gear or pinion h^5 . Also fixed to the shaft near the face of gear or pinion h^5 is a segment-plate h^{15} , connected to the gear h^5 by a spring h^{13} , having one end fast to the segment-plate and the other fixed to the gear h^5 by a block or projection h^{12} . The knife h^8 and segment-plate h^{15} have a full rotary movement with the rotation of the shaft h^6 through the spring connection described, yet the shaft and

knife may be interrupted in their rotation at intervals by the means now to be described. Fast upon the face of the gear h^5 is a cam-piece h^{16} , the cam-surface of which projects beyond the periphery of gear h^5 and is adapted to contact with a spring-pressed pin m , mounted in a housing h^{14} on the frame of the machine and normally pressed toward the gear by a spring s . In its normal position the pin m projects into the path of one end of the segment-plate h^{15} , the rotation of which and knife h^8 is thereby checked, and the spring h^{13} , connecting the rotating gear h^5 and the segment, is consequently put under tension. Continued rotation of gear h^5 causes the cam-piece h^{16} to contact with a projecting arm m' of the spring-pin m and force the pin from contact with the segment-piece, whereupon the segment is released and the spring throws the knife down past the edge of the fixed knife h^9 with a sharp quick cutting action, the operation being repeated at each full rotation of the gear h^5 . In Fig. 5 the parts are shown as at nearly the full limit of tension, and it will be seen that the cam-piece h^{16} has just entered into contact with the arm m' of the spring-pin, partly forcing back the pin. As soon as the full side of the cam has forced the pin back the segment, the shaft, and knife carried thereby will spring forward, bringing the knife-edge past the fixed knife by a quickened shearing action. On the other end of shaft h^6 is fixed a wheel h^{17} , having a projecting eccentric-pin on its face, said pin in the rotation of the wheel striking the bell h^{18} , and this is provided as a counting device. For example, if the wheel is so provided as to make one rotation for every one or more cuts of twelve inches of tape the eccentrically-arranged pin will strike the bell at each revolution of the shaft h^6 . Hence each ring of the bell denotes a definite length of tape cut off.

The mode of operation of the device is apparent from the foregoing description, but may be briefly stated as follows: The machine is adapted to operate on as many strings at a time as there are rolls of raw material and guides for the same before and after waxing or coating. Feeding in the raw or uncovered strings from separate rolls and so mounting the same that they let off the strings by unwinding, due solely to the pull on the wound strings, results in a uniformity of let-off. The spring tension devices interposed between the same and the unwinding and delivery rolls above the waxing-receptacle keep the strings taut and deliver them without kinking to and on the said delivery-rolls and by the latter in the same condition to the waxing-receptacle and its contained composition. The drawing tension on the strings by the geared rolls h^3 h^{23} operating in sequence after the cooling-chamber results not only to prevent a back pull and the kinks which might result therefrom, but said geared rolls h^3 h^{23} also forcibly eject and deliver the

coated tapers or strings properly and with uniformity as to time and as to length of string to the cutting mechanism. The indirect heating of the waxing composition by means of heat radiated through the false bottom of the receptacle from the heated sand contained in the real bottom maintains an even temperature and the cooling by a sequential chamber adapted to be filled and replenished with iced water with a stirring device therein which keeps the temperature even, as the tendency is to heat the water at the top surface, where the heated strings pass through. The cutting device is so far peculiar that the shearing action is an intermittent forcible blow, which results in a clean cut without leaving ragged edges or frayed strands, a defect common in such machines, and the provision of guides immediately in front of the stationary blade of the shearing device results in presenting the waxed string at a proper angle to the descending blade of the shearing mechanism. The cutting off of definite lengths, due to an arrangement or sizing of gears, is common to machines of this character and is not new; but the arrangement of an annunciator adapted to be sounded by contact mechanism mounted on or actuated by the rotating gearing, which actuates also the cutting device of one member, is, I believe, novel with me. The cut-off strings drop into a basket or any other appropriate receptacle.

I am aware of the machines of like general character as a whole described in the prior patents No. 289,773, dated December 4, 1883, to Johnston, and No. 303,984, dated August 26, 1884, to Coddington. It is not new with me, nor was it then new with either of said patentees, to make apparatus or machines which by one continuous operation fed forward the raw or uncovered strings and guided, waxed, cooled, and cut the finished or coated tapers or strings, and I do not claim, broadly, any such machine. What said two-named patentees respectively invented and described in their patents, as also what I have invented, are improvements in the several mechanisms constituting the elemental parts of such a complete device, although I have added to my machine a tension mechanism and combined the same with a rearrangement of the other elements, so that a new combination as a whole has been produced, the distinguishing and differentiating features of which are the novel character of each of the several other elements constituting the whole and the novel character of the whole resultant continuously-operating mechanism as a new combination of generically old but specifically new elements.

Having thus described my invention, its construction, and mode of operation, what I claim as new and of my invention is—

1. In a machine for making waxed strings and tapers, the combination with a supporting-frame, of let-off rolls, driven rolls be-

tween the let-off rolls and waxing-pan operating primarily to rotate the same by frictional pull on the wick wound thereon, and secondarily to guide and deliver the string in a taut and uninked condition to the waxing composition, a tension device between said let-off rolls and driven rolls, a pan containing waxing composition, and a pair of geared pressure-rolls operating to draw the waxed strings through and from the waxing-pan in a like taut and uninked condition; substantially as described.

2. In a machine for making waxed tapers and strings, the combination with the supporting-frame, of let-off rolls, tension mechanism, driven rolls operating to draw the wick from the let-off rolls and deliver it to the waxing composition in an uninked condition, a waxing-pan, a cooling device, a pair of geared pressure-rollers operating to draw the waxed strings through the wax-pan and deliver them to cutting devices, a main shaft to drive said pressure-rolls, connecting actuating means between the shafts of the same and the drawing-rolls and cutting device, operating to drive all of the same in unison, and cutting mechanism consisting of a pair of shears, one member of which is fixed and the other adapted to be rotated; substantially as described.

3. In a machine for manufacturing waxed tapers, the combination of let-off rolls, a pair of drawing-rolls between the let-off rolls and waxing-pan and belt for driving the same, tension and guiding devices interposed between the let-off rolls and drawing-rolls, a waxing-pan provided with guiding devices therein, a pair of pressure-rolls, a pulley carried by one of said rolls and a belt connection between the drawing and pressure rolls.

4. In a machine for making waxed tapers and strings, comprising a supporting-frame, let-off rolls, tension device, drawing-rolls, geared pressure-rolls, connecting actuating mechanism between the same whereby said drawing-rolls are driven by the shaft of the pressure-rolls, of a waxing-pan and a water vessel arranged between said drawing and pressure rolls, said pan having means to heat the same and said water vessel having automatic stirring devices adapted to agitate the liquid; substantially as described.

5. In a machine for making waxed tapers of a definite length, the combination with a suitable supporting-frame, let-off devices, a waxing and cooling device, geared pressure-rollers operating to draw the coated strings therefrom and deliver them at a fixed speed to cutting devices, connecting gearing driving said cutting devices from the shaft of one of the pressure-rollers, and a cutting mechanism comprising a fixed cutting member, and a movable member, the latter consisting of a rotating blade, spring-controlled devices for retarding the rotation of said blade at predetermined times, and a trip for releasing the blade to the action of the spring.

6. In a machine for making waxed tapers

of a definite length, the combination with
mechanism for waxing and delivering strings,
comprising a pair of geared pressure-rollers,
gearing thereon connecting the same with and
5 driving the rotating shaft of a cutting device,
of a cutting mechanism comprising a fixed
member and a movable member, the latter
consisting of a rotating blade, a shaft carry-
ing the same, a gear loosely mounted on the
10 shaft a spring connection between the gear
and shaft, a pin to periodically retard the ro-
tation of said shaft, to thereby put tension

on said spring connection, and a cam to trip
said pin to permit the shaft and blade to move
with a shear-like action under the impulse of 15
the spring connection.

In testimony whereof I have hereunto af-
fixed my signature this 7th day of September,
A. D. 1899.

AUGUST PROPFÉ.

Witnesses:

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H. T. FENTON.