

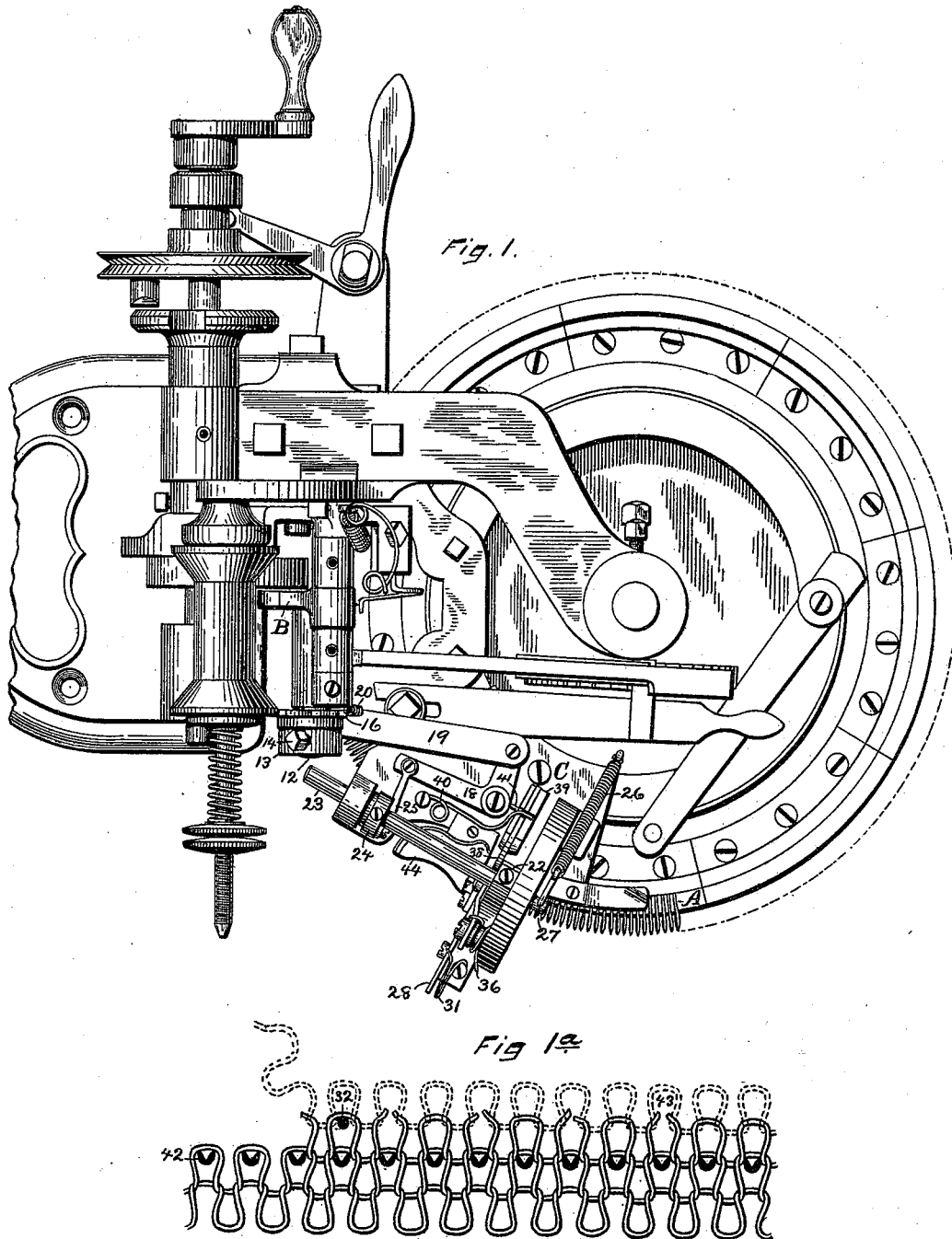
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3 Sheets—Sheet 1.

A. F. CHAMPLIN.
MACHINE FOR SEWING LOOPED FABRICS.

No. 421,549.

Patented Feb. 18. 1890.



WITNESSES.
John Edwards Jr.
W. H. Whiting

INVENTOR.
Amos F. Champlin.
By James Shepard.

Att'y.

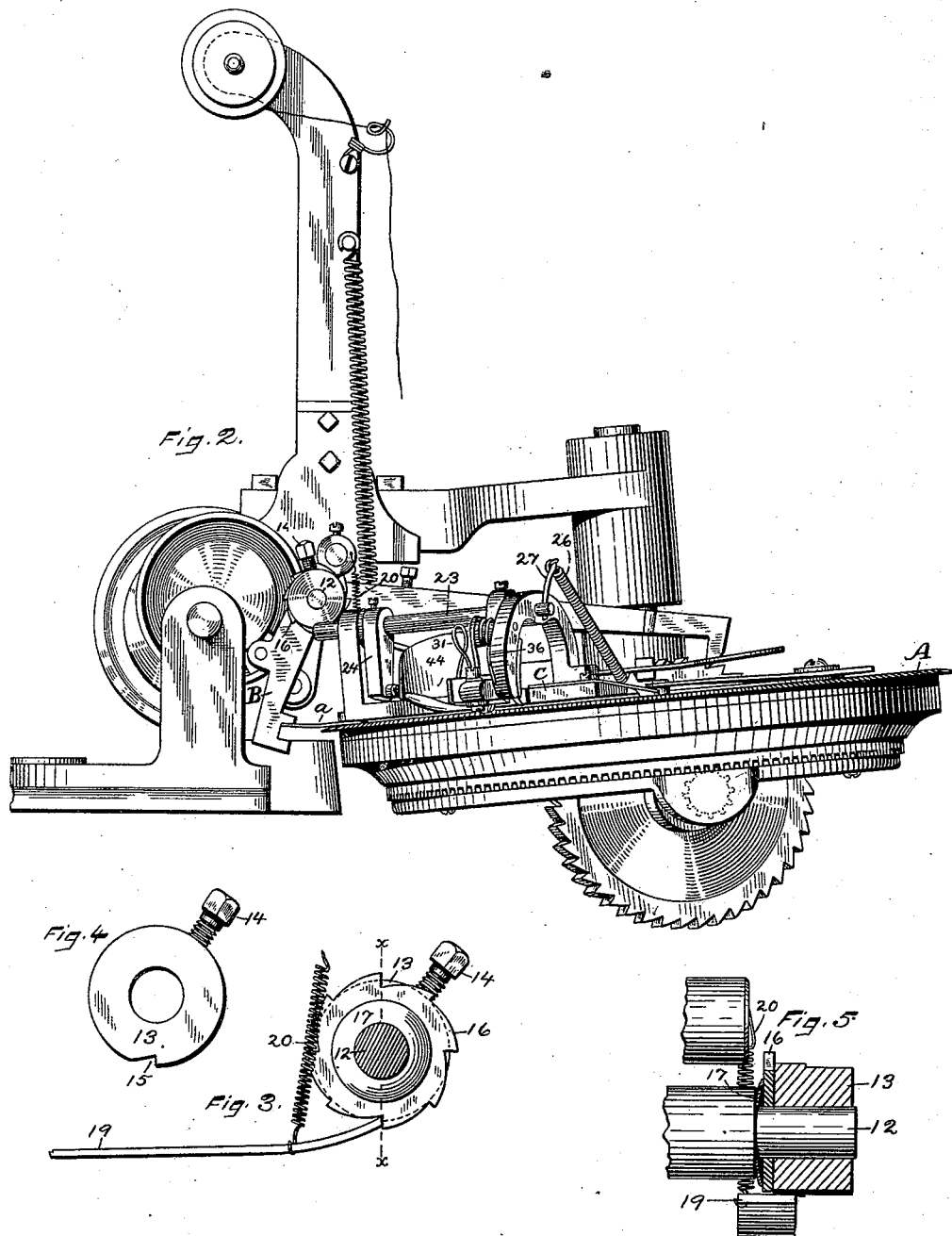
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H. B. Whitney

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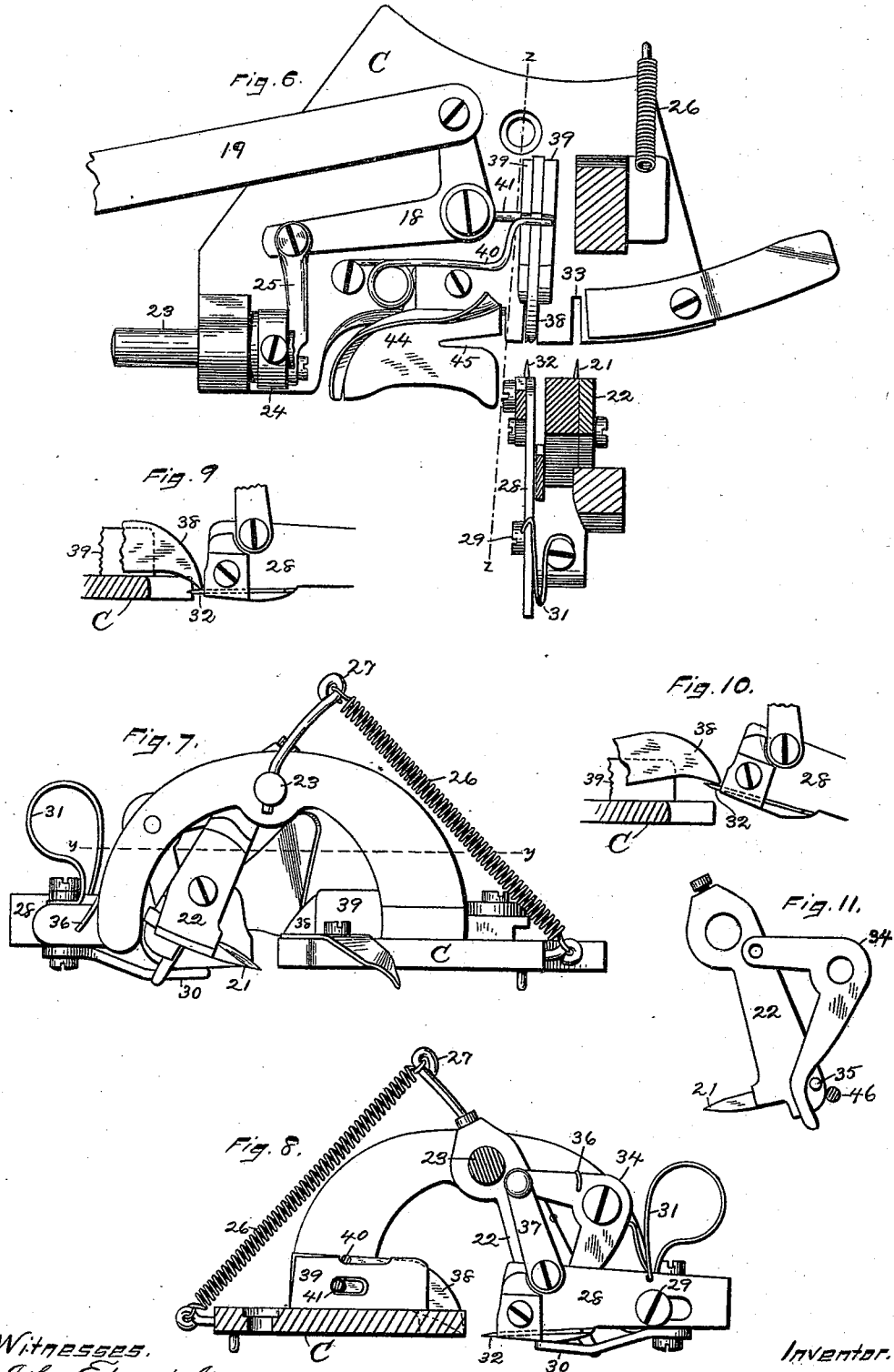
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By James Shepard. Atty.

UNITED STATES PATENT OFFICE.

AMOS F. CHAMPLIN, OF GRANBY, CONNECTICUT.

MACHINE FOR SEWING LOOPED FABRICS.

SPECIFICATION forming part of Letters Patent No. 421,549, dated February 18, 1890.

Application filed December 24, 1888. Serial No. 294,534. (No model.)

To all whom it may concern:

Be it known that I, AMOS F. CHAMPLIN, a citizen of the United States, residing at Granby, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Trimmers for Looping-Machines, of which the following is a specification.

My invention relates to improvements in machines for uniting knit fabrics, said machines being generally called "circular-looping machines;" and the principal object of my invention is to provide a trimmer which will leave a clean smooth edge without any projecting ends or loose threads.

In the accompanying drawings, Figure 1 is a plan view of an ordinary circular-looping machine with my trimmer attached. Fig. 1^a is a diagram illustrating the operation of my trimmer. Fig. 2 is a front elevation of said circular-looping machine with my trimmer attached. Fig. 3 is a detached view on an enlarged scale of devices connected with the rocking needle-arm for actuating my trimmer, the pin or stud bearing said devices being shown in vertical transverse section, and the devices being illustrated as viewed from the rear. Fig. 4 is a detached rear elevation of the driving-collar. Fig. 5 represents said actuating devices, partly in side elevation and partly in section on line *xx* of Fig. 3. Fig. 6 is in the main a plan view of my trimmer as detached from the machine, with parts thereof shown in horizontal section on line *yy* of Fig. 7. Fig. 7 is a side elevation, as viewed from the right, of my trimmer as detached from the machine. Fig. 8 is a partial side view and partial section on line *zz* of Fig. 6, as viewed from the left. Fig. 9 is a detached view showing mainly a side elevation of the picker in the early part of its movement. Fig. 10 is a like view thereof in an advanced position, and Fig. 11 is a side elevation of detached parts of the mechanism for operating the picker. Figs. 3 to 11, inclusive, are on a scale twice that of Figs. 1 and 2.

As in ordinary circular-looping machines, the work to be sewed is arranged with certain rows of its loops upon the pins of the pin-wheel A, and said wheel is rotated with an intermittent movement equal to one loop

to bring the work pin by pin and loop by loop to the action of the sewing mechanism, in which *a* is the needle, said needle being mounted upon the rocking needle-arm B, all as in ordinary machines of this class, and therefore a further description of said machine is considered unnecessary. In the machine illustrated the sewing mechanism makes the ordinary stitch, the needle making one reciprocating movement for every intermittent movement of the pin-wheel. In a machine of the kind known as "double-seaming" the needle makes an extra movement relatively to the movement of the pin-wheel, and if my trimmer is to be attached to such a machine the strokes of the needle should be taken into consideration in arranging the actuating mechanism for the trimmer.

Projecting from one side of the needle-arm B there is a round stud 12, upon which is mounted the driving-collar 13, said collar being provided with a set-screw 14, or other device for fastening it rigidly upon said stud. This collar is provided with a notch 15, Fig. 4, one side of which presents an abrupt shoulder. Upon the rear side of the collar there is a friction ratchet-plate 16, having eight teeth, the space or notch between every other one of which is of a depth equal or nearly equal to the depth of the notch 15, while the other spaces are of a depth which will not quite reach the periphery of the collar 13. This ratchet-plate is held from turning accidentally on its bearings by means of the spring-washer 17. (See Figs. 3 and 5.) As the needle-arm B moves forward in making its stroke, the stud 12 and attached devices necessarily move forward in the arc of a circle.

I form my trimming device upon the plate C, which plate I fasten to a stationary hub or disk about which the pin-wheel rotates. Upon this plate I attach the angle-lever 18, to one end of which I secure one end of a pawl-bar 19, the opposite end of which pawl-bar is in contact with the ratchet-plate 16 and at times with the driving-collar 13. This pawl-bar is held against said ratchet-plate by means of the spring 20. When the stud 12 and attached devices make their forward stroke, if one of the deep spaces of the ratchet-plate coincides with the notch in the driving-col-

lar 13 said collar engages the end of the pawl-bar, moves the pawl-bar longitudinally, and thereby imparts a movement to the angle-lever 18 for operating the trimmer. Said angle-lever makes its return movement under the influence of a spring hereinafter described. When the stud 12 moves forward and the pawl 19 rests in a shallow space of the ratchet-plate 16, the end of said pawl-bar is held out of engagement from the notch 15 of the driving-collar 13, and consequently during such forward stroke the ratchet-plate merely slips on its frictional bearing without moving the pawl-bar 19 longitudinally. It will thus be seen that the actuating devices operate the angle-lever 18 and the trimming attachment only at every alternate movement of the needle-arm and pin-wheel. In case the needle-arm has more movements than the pin-wheel the actuating mechanism will be modified accordingly to actuate the trimming attachment only at each alternate movement of the pin-wheel. This may be accomplished by changing the relative number of shallow spaces in the ratchet-plate. In all cases, however, the deep and shallow spaces will occur in alternation—that is to say, no matter whether there is one or more of the shallow spaces between each deep space, the necessary number will alternate with the several deep spaces. For example, in the drawings there is only one shallow space between each deep space; but if the needle-arm should make, say, two movements for each movement of the pin-wheel, then there will be three shallow spaces alternating each of the deep spaces. The term in claim 4, “spaces between its teeth of alternating varying depths,” is intended to apply to both of these constructions or any modification of the relative numbers of deep and shallow spaces that may be used to accomplish the same result.

My trimming device is believed to differ from prior ones in the fact that instead of trimming or cutting the entire fabric through and through in the line presented to the cutter I only cut the thread or yarn of certain loops of the fabric in said line, and then pick out the intermediate sections of threads between the points so cut, thereby leaving the trimmed edge free from all ragged or projecting ends in precisely the same condition that it would be if it had been raveled.

21 designates the cutter for cutting the loops, said cutter being mounted upon a rocking arm 22, which arm is mounted upon the rock-shaft 23, supported in suitable bearings on the plate C. Said cutter consists of a pointed blade sharpened on its upper edge, and it is mounted on the rocking arm at substantially right angles thereto, so that it has practically a longitudinal movement in a direction radially to the pin-wheel. Said rock-shaft is also provided with a rocking arm 24, the lower end of which is connected by a pitman 25 to one arm of the angle-lever 18,

which angle-lever, as before described, is moved in one direction by means of the actuating mechanism. The rock-shaft and angle-lever are moved in the opposite direction by means of the spring 26, one end of which is fastened to a projection of the plate C and the other end to an arm 27, that projects from the rock-shaft 23. The work on the pin-wheel comes immediately in front of the edge of the plate C, and said plate is slotted at 33, Fig. 6, immediately in rear of the knife which enters said slot, whereby the edge of the plate forms a work-support and holds the work on the pin-wheel against the thrust of the cutter in cutting the loops.

28 designates the picker-bar, which is secured to a stationary projection on the frame attached to the plate C by means of the screw 29, which passes through a slot (see Fig. 8) in said bar. The picker-bar 28 is supported when at rest by the support 30, Fig. 8, on which the lower side of the bar rests. A spring 31 is secured by one end to the frame and by its other end to the picker-bar, and has a constant tendency to move said bar longitudinally to the rear. The rear end of the picker-bar has attached to it the picker-point 32, which has a needle-like forward end, the length of which point extends radially to the pin-wheel. Mounted upon a stationary part of the frame is an angle-lever 34, the lower end of which is of a peculiar curved form, as shown in Fig. 11. A pin 35, Fig. 11, on the side of the cutter-arm 22, bears against the edge of this lever, so that at each stroke of the cutter-arm said angle-lever is moved in one direction. It is moved in the opposite direction by means of the spring 36, of any suitable construction—as, for instance, a spiral spring coiled about the screw, by which said angle-lever is pivoted to the frame and having one end hooked or fastened to said frame or stationary support, while its other end is hooked over the edge of said angle-lever 34, as shown. The upper arm of this angle-lever is connected by means of a pitman 37 to the rear end of the picker-bar 28, whereby the combined movements of the spring 31 and angle-lever 34 impart to the picker-bar, first, a longitudinal rearward movement, and, second, a swinging movement in an upward direction. In order to make certain the forward movement of the picker-bar 28 away from the pin-wheel, I provide it with the pin 46, Fig. 11, against which the side of the cutter-arm 22 acts, as shown in said figure, said pin being located on that side of said picker-bar that confronts said cutter-arm. In connection with the picker point and bar I employ a pressing-finger 38, the front end of which is adapted to press upon the loop at the top of the point. This finger lies loosely in guides 39 on the top of the plate C, and is held down by means of the spring 40, the end of which rests in a notch in the top of said finger, said spring being so arranged as also to impart to

the finger, when released, a slight forward movement. An arm 41 projects from the angle-lever 18 into a slot in the body of said finger, the slot being of such length that when the angle-lever is at rest, as shown in Figs. 6 and 8, said arm strikes the rear end of the slot and holds said finger in its rear-most position, the arm 41 releasing the finger and letting it slide forward simultaneously with the rearward movement of the picker at each movement of the trimming devices.

As illustrated, I have arranged the cutter 21 and the picker-point 32 a distance apart equal to seven pins of the pin-wheel, or, in other words, there are six pins of the pin-wheel between said cutter and picker-point. The diagram, Fig. 1^a, illustrates a looped fabric placed upon the pins 42 of the pin-wheel and the manner of cutting the same. The cutter first acts upon the loops above one of the pins 42 to cut them at the point 43, the point of the cutter first entering the loops and then finally severing them by a single cut as the cutter presses rearwardly against the edge of the plate C when the pin-wheel is at rest. At the next movement of the pin-wheel the loops thus cut are carried forward a space equal to the distance from pin to pin, or, in other words, equal to one loop, the cutter during the period of rest following said movement being idle, so that the loops above the succeeding pin are not cut; but after the second movement of the pin-wheel other loops are cut, leaving an uncut portion between each of the cuts. After four such cuts have been made, and simultaneously with making the fifth cut at the point 43, the picker-point 32 moves rearwardly to enter the uncut loop, as shown in Fig. 1^a, in which figure the point 43 indicates the proper position of the cutter 21 relatively to the picker-point 32. Simultaneously with this rearward movement the pressing-finger 38 moves forward and presses the yarn between said finger and picker-point, this position of the pressing-finger and picker-point being illustrated in Fig. 9. The picker-point then swings upwardly, carrying the pressing-finger with it, into the position shown in Fig. 10, thereby pulling out that portion of the thread or yarn which lies between the two cut loops and wholly separating it from the fabric, leaving the fabric free from all loose ends, with its upper loops lying upon the pins of the pin-wheel, as shown at the left-hand end of the diagram, ready for the operation of the sewing mechanism. The pieces of thread or yarn thus pulled out by the picker fall upon the waste pan or guard 44 and are discharged from the machine. It should be noticed that the picker grasps the sections of cut threads at a point about the middle of their length, whereby the pull will be even on both sides of the picker and both ends will be pulled out.

It sometimes happens that the work is not properly placed upon the pin-wheel with the

loops all in a row, in which case a longer thread will remain to be picked out by the picker, and inasmuch as the picker would not take hold of said thread at the middle the entire thread might not be pulled out thereby. I therefore provide the slot 45 in the waste-pan, into which any projecting thread may be drawn and wedged so as to be pulled from the fabric as the pin-wheel passes under said pan.

I claim as my invention—

1. In a looping-machine, the combination of the intermittently-moving pin-wheel, its operating mechanism, the reciprocating pivoted cutter, pointed and sharpened at its upper edge and having said upper edge extending in a radial direction to said pin-wheel and mounted to move in a given path in a definite relation to said pin-wheel at a distance above the pins of the pin-wheel equal to one loop of the fabric being trimmed, whereby said knife at each stroke enters and cuts the loops of the fabric next above the pin which is under said knife, substantially as described, and for the purpose specified.

2. In a trimming attachment for looping-machines, the combination of a pin-wheel, a cutter for cutting the loops at every alternate pin of the pin-wheel, a picker consisting of a needle-like point whose length extends substantially in a radial direction to said pin-wheel, and mechanism for operating said pin-wheel, cutter, and picker, substantially as described, and for the purpose specified.

3. In a looping-machine, in combination with operating mechanism, a pin-wheel for supporting the work to be trimmed and sewed, the pointed cutter extending in a radial direction to said pin-wheel, sharpened at its upper edge and mounted to reciprocate in a given path at a given distance above the pins of the pin-wheel for entering and cutting the loops of the fabric on said pin-wheel in trimming the same, and a work-support in opposition to the thrust of said cutter when cutting said loops, substantially as specified.

4. In a looping-machine, the pin-wheel, a rocking arm, mechanism for reciprocating said arm at regular intervals and also for imparting an intermittent forward movement to said pin-wheel, a driving-collar having a shouldered notch and mounted on said rocking arm to reciprocate therewith, a friction ratchet-plate by the side of said collar, having spaces between its teeth of alternating varying depths, the pawl-bar 19, one end of which engages said ratchet-plate and collar, and a trimming attachment operatively connected with the opposite end of said pawl-bar, substantially as described.

5. In a looping-machine having a pin-wheel and trimmer, the picker-bar 28, mounted for sliding longitudinally and swinging upwardly, the needle-like picker-point mounted on and projecting from the swinging end of said bar and standing with its length in a radial direction to said pin-wheel, and operating

mechanism for imparting said movements to said bar and point, substantially as described, and for the purpose specified.

6. In a trimming attachment for looping-
5 machines, the picker-bar 28, its operating mechanism, the picker-point 32 on the swinging end of said bar, and the pressing-finger 38, for acting on the upper side of said point, substantially as described, and for the purpose specified.

7. In a trimming attachment for looping-
10 machines, the picker-bar 28, picker-point 32 on the swinging end thereof, the spring 31, the pitman 37, angle-lever 34, and operating mechanism for said lever, substantially as described, and for the purpose specified.

8. In a trimming attachment for looping-
15 machines, the combination of the picker-point, its operating mechanism, the pressing-

finger 38, guides 39, in which said finger is 20 mounted to slide, the spring 40, and the reciprocating arm 41, engaging with said pressing-finger, substantially as described, and for the purpose specified.

9. In a trimming attachment for looping- 25 machines, the combination of a pin-wheel, a cutter for cutting the loops above every alternate pin, the cutting-edge of which cutter extends substantially in a radial direction to said pin-wheel, a picker for removing the 30 sections so cut, and mechanism for operating said pin-wheel, cutter, and picker, substantially as described, and for the purpose specified.

AMOS F. CHAMPLIN.

Witnesses:

JOHN EDWARDS, Jr.,
JAMES SHEPARD.