March 23, 1954 A. R. GLASSMAN 2,672,932

MACHINE TO SLIT MATERIAL

Filed Dec. 13, 1949 5 Sheets-Sheet 1

Fig. 1.

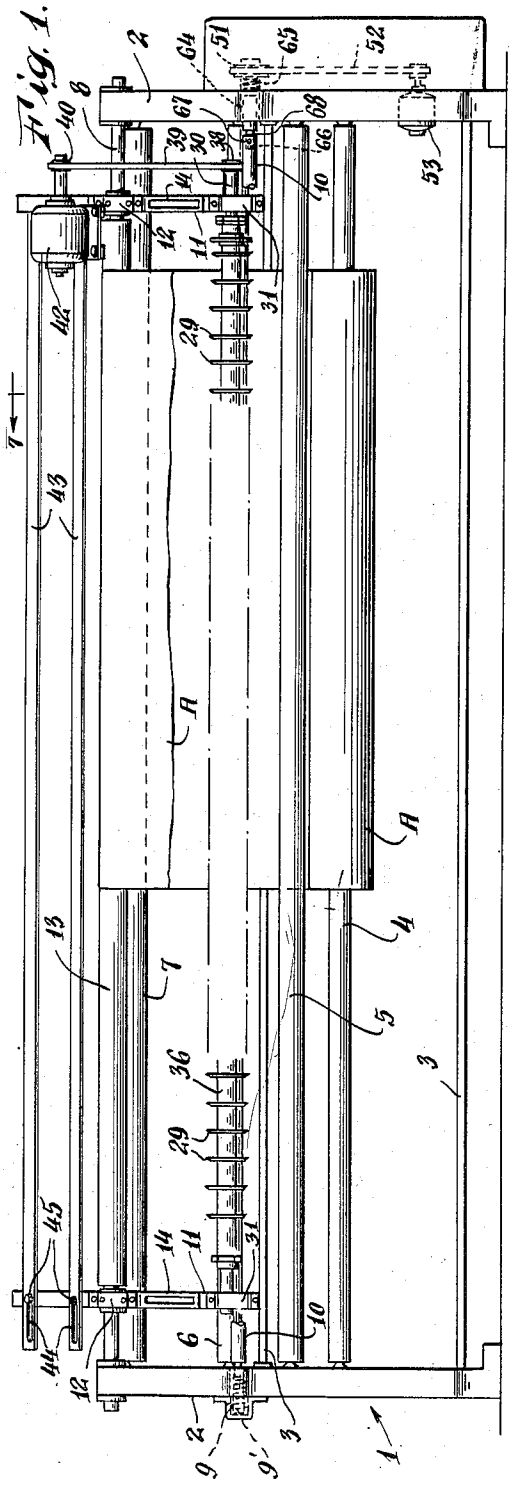
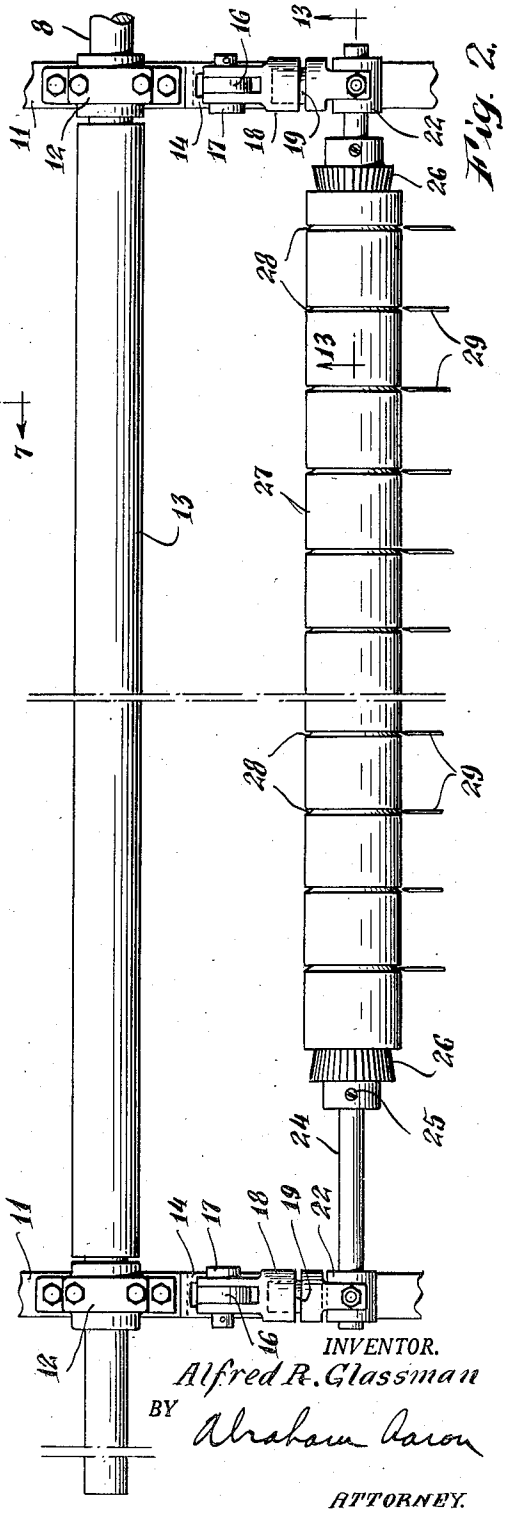


Fig. 2.



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MACHINE TO SLIT MATERIAL

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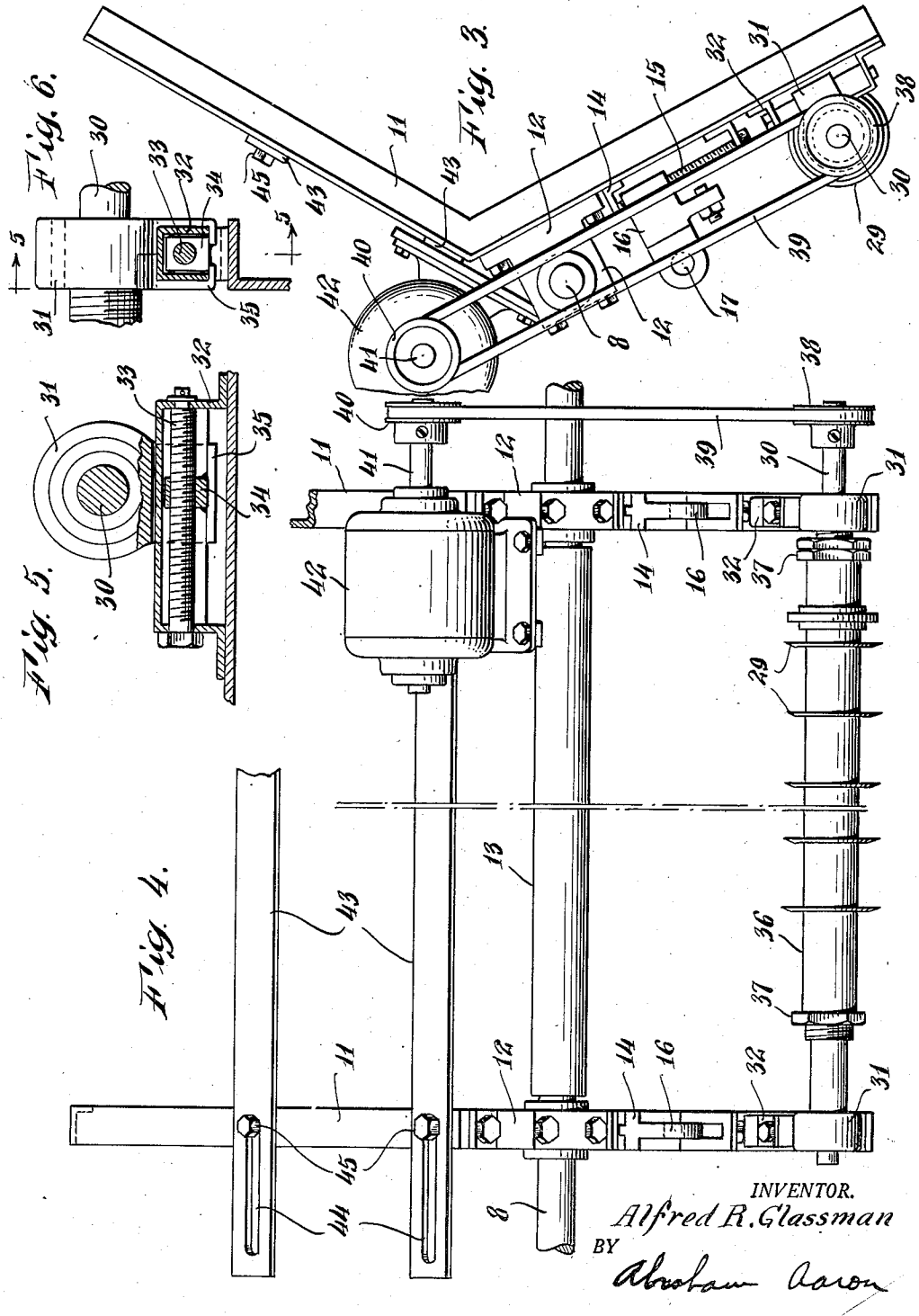

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Fig. 8.

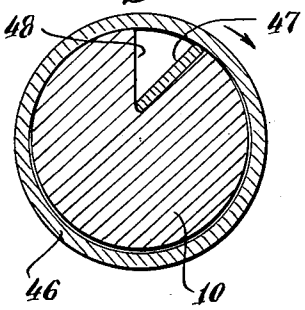

Fig. 9.

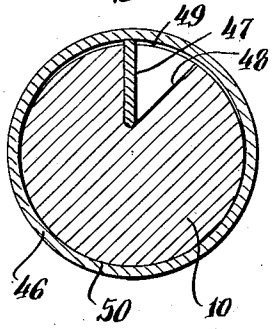

Fig. 7.

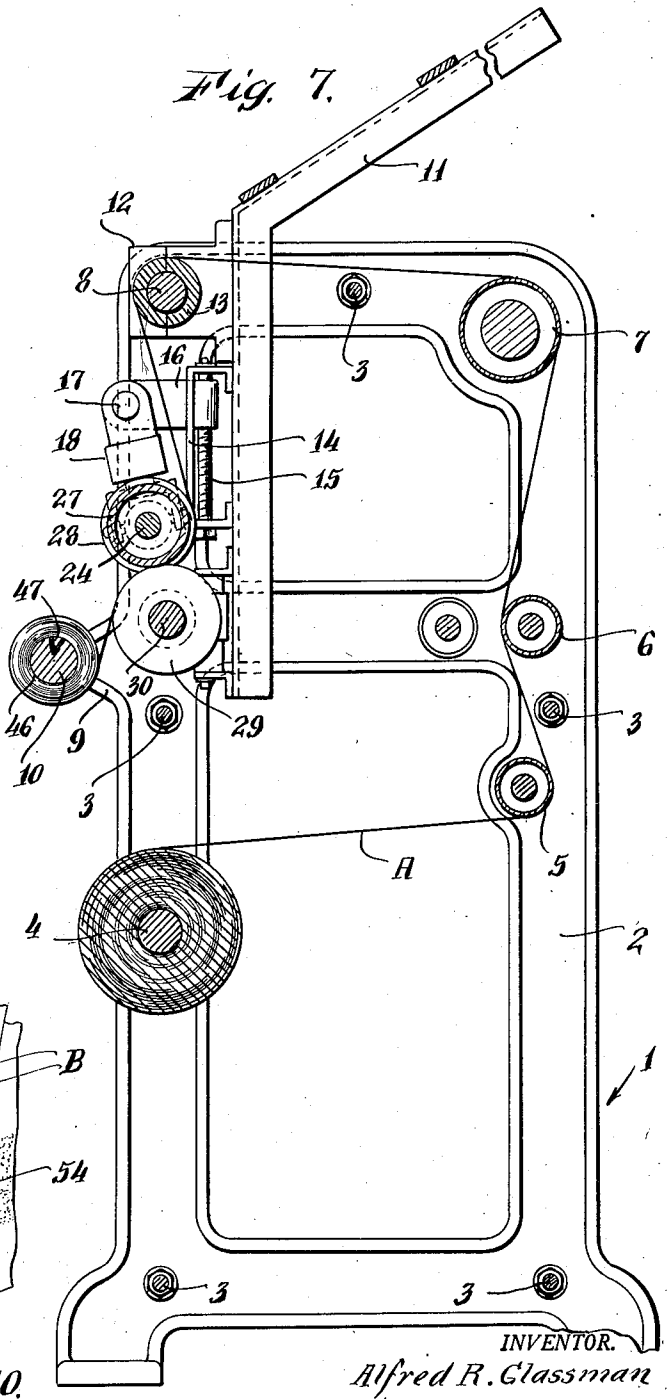

Fig. 10.

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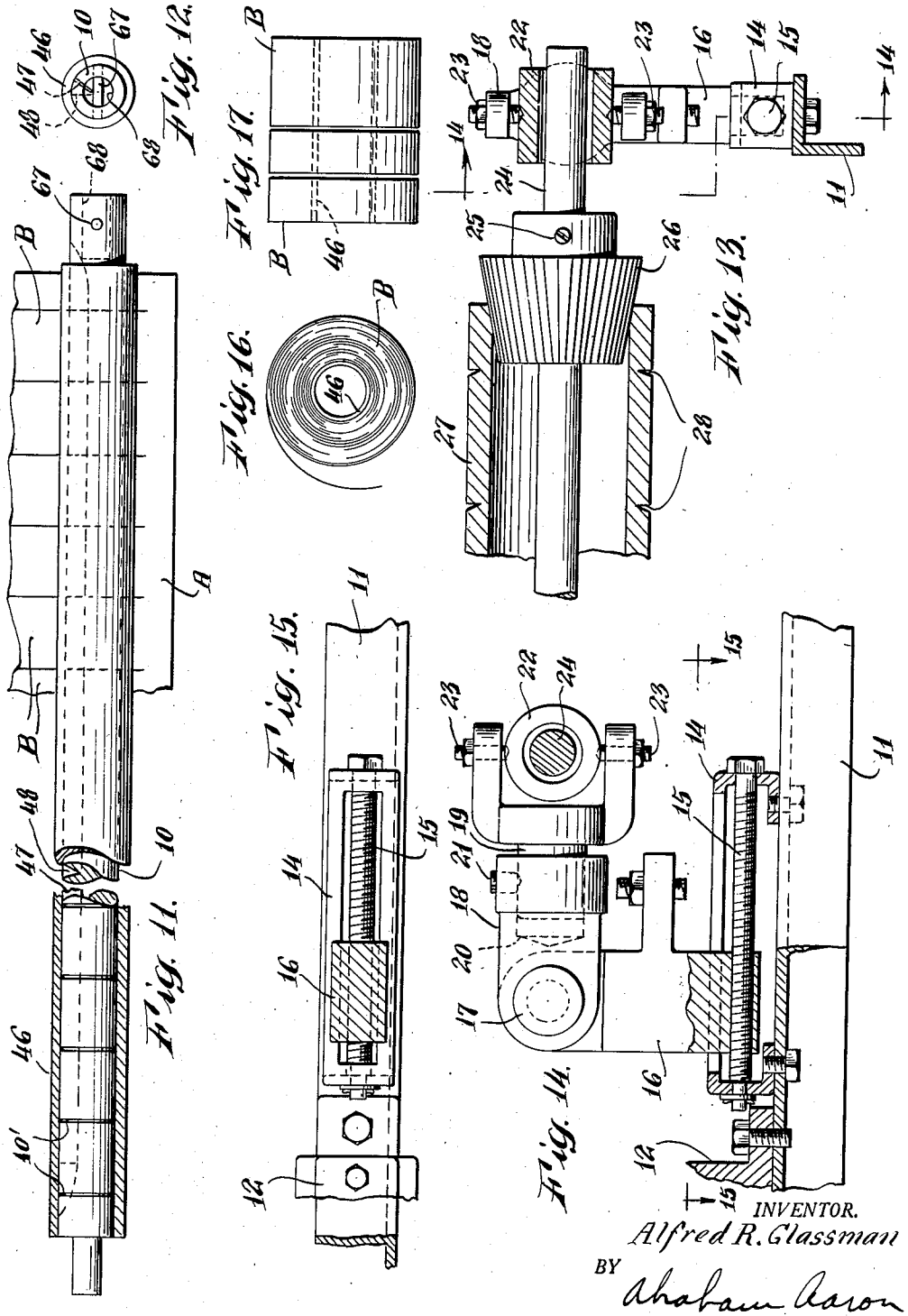

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Fig. 18.

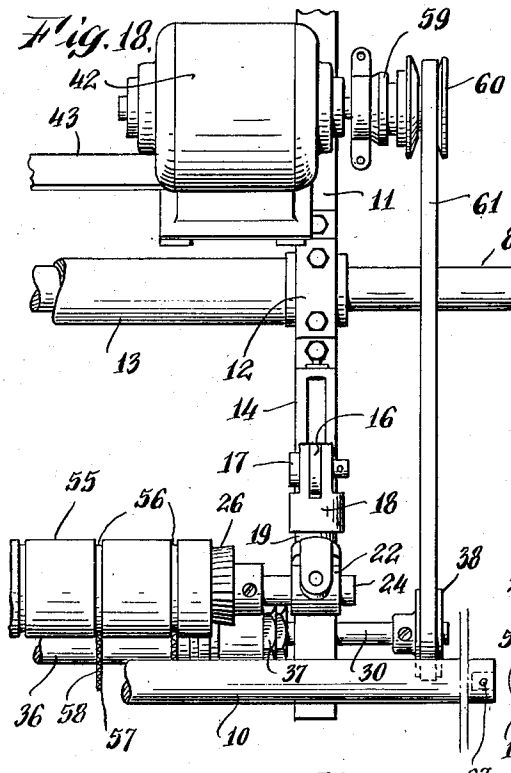


Fig. 19.

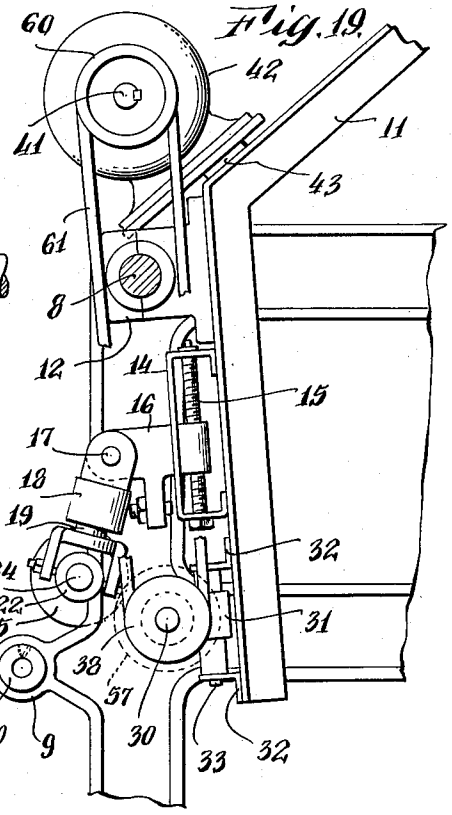


Fig. 20.

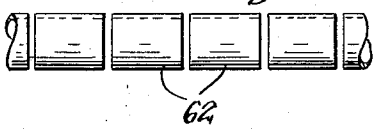


Fig. 21.

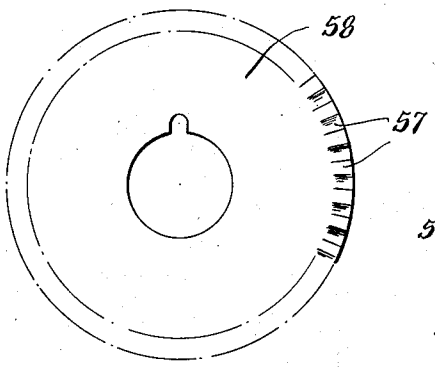


Fig. 22.

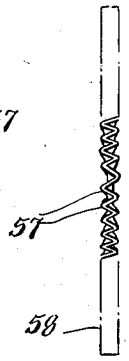
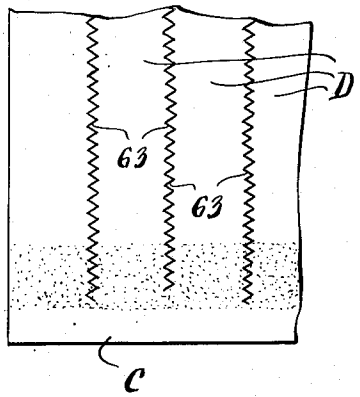
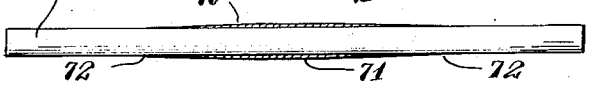


Fig. 23.



E

Fig. 24.



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Patented Mar. 23, 1954 2,672,932

UNITED STATES PATENT OFFICE

2,672,932

MACHINE TO SLIT MATERIAL

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Application December 13, 1949, Serial No. 132,668

1 Claim. (Cl. 164—65)

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The purpose of my invention is to provide a machine to slit material or cutting strips of material in various widths from material mounted on my machine, cutting same from end to end in lengthwise position and also cuts the full width of the material in any width strips desired and as many width of strips as the material allows for from the overall width.

A further purpose of my invention is that the multiple knife circular cutters, cut a straight smooth edge on all strips, with a core that is cut, upon which the strips of material wind as the strips are cut.

A further purpose of my invention is that the knife edge is preserved in its sharpness by cutting through the material only, the knives being mounted are circular in form, are set on the roller and spaced as desired, revolving with the roller on which the knives are rigidly mounted.

I also provide a circular knife edge which is used for pinking as will be hereinafter explained.

Referring to the drawings which illustrate my invention:

Figure 1 is the front elevation of the strip cutting machine.

Figure 2 is an enlarged front elevation of the machine showing details of the follower roller.

Figure 3 is the side elevation of the tilting frame and details.

Figure 4 is the front elevation of Figure 3.

Figure 5 is the section taken on the line 5—5 of Figure 6.

Figure 6 is an end elevation of Figure 5 partly in section.

Figure 7 is the section taken on the line 7—7 of Figure 1.

Figure 8 is the section of the takeup roller.

Figure 9 is a view similar to Figure 8 in locked position.

Figure 10 is a perspective view of a portion of the strip showing the cutting lines and the adhesive.

Figure 11 is an elevation of the takeup roller with one position in section.

Figure 12 is an end view of the takeup roller.

Figure 13 is a section on the line 13—13 of Figure 2 illustrating the follower roller adjusting mechanism.

Figure 14 is the section taken on the line 14—14 of Figure 13.

Figure 15 is the section taken on the line 15—15 of Figure 14.

Figure 16 is an end view of the completed roll of material.

Figure 17 is an elevation of the completed rolls of material showing variation in widths.

Figure 18 is a partial front elevation of the machine modified to perform pinking.

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Figure 19 is a side elevation of Figure 18.

Figure 20 is an elevation of the units of cores ready to be stripped onto the winding shaft.

Figure 21 is an elevation of the pinking cutter.

Figure 22 is an end view of the pinking cutter.

Figure 23 is a portion of the completed material illustrating the pinked cuts.

Figure 24 is an elevation of the tapered roller.

Referring to the drawings specifically, a strip cutting machine 1, comprising upright main frames 2, a series of tie rods 3, supply roller 4, idler rollers 5, 6 and 7, a supporting shaft 8, and the bearing 9, with the spring 9' for the material take-up roller 10. Tilting frames 11 are positioned between the main frames 2 by means of the bearings 12 around the shaft. An idler roller 13 is placed over the shaft 8 intermediary the bearings 12. The said frames 11 are constructed of two arms forming an approximate 120 degree angle. The vertical portion of the frame 11 carries the bearings 12. Below the bearings are mounted the brackets 14 through which are anchored the take-up screws 15. Said screws carry the arms 16, the outer extremities of which terminate in pivot points 17 to which adjustable yoke members 18 are pivoted. Said yokes consist of two members (see Figure 14), a peg 19 extends from one section into the fitting bore 20 in the other section, and held by the set screw 21. This will permit adjusting the length of the yokes. The yoke sleeves are straddled at 22 and are held by the set screws 23, said pressure tube 27 passes over the pressure shaft 24. The pressure tube 27 is of such a material that it will be scored by the rotating motion of the cutting blades 29 forming a series of recesses. The pressure shaft has secured to it by the screws 25, two tapered conical spindles 26. Said conical spindles hold the pressure tube 27 on their tapered surfaces and prevent it from turning except when A material is in motion (see Figure 1). A plurality of spaced tapered slits 28 on the pressure tube 27 circumscribe the roller which is the exact female impressions of the taper on the cutters 29, said slits having been cut by the circular cutters 29 mounted onto the cutter shaft 30. The said shaft 30 is journaled in the bearings 31, said bearings being self-aligning and adjustably mounted to frame 11. Angle irons 32 are secured to the frame 11 and screws 33 are anchored between the two ends. Figures 5 and 6 show adjustable self-aligning take-up unit. The bearings each have a nut 34 welded to the depending flanges 35 of the bearings, said nut goes over the screw and has clearance of the channel walls. (See Figures 5 and 6.) The spacing is provided by the sleeve 36 bearing against the sides of each cutter 29 and then held together by the nuts 37. A pulley 38 is

secured to the extremity of the shaft 30 which is driven by the belt 39 from the pulley 40 secured to the motor shaft 41 of the motor 42. Said motor is anchored to the upper arm of the tilting frame 11 by being secured to one of the supporting bars 43. These bars are slotted at 44 through which the bolts 45 are tapped into the frame 11, said bars being provided to adjust the frame into the exact parallel, or fixed rigid position. It will be seen by Figures 3 and 4 that the tilting frame and the component parts are one complete unit which is able to be tilted to any position required around the shaft 3. As the material A to be cut, is fed off the supply roller 4 over the idler rollers 5 and 6, it goes between the pressure roller and the cutters, being cut into strips B of a desired width, then finally being wound onto a similar plurality of cores 46 which have been previously cut by the cutters while on the roller 10. The grooves on material take-up roller 10 are spaced so that the cutters will cut through the core to make certain size cores and grooves which prevents the knife from being dulled (see Figure 11). In order to hold these cores in place, a wedge 47 is provided, set into a V-slot 48 in the roller 10.

Figure 8 shows the core as first applied with the wedge on the lower surface of the V slot but as the roller turns in the direction of the arrow, the wedge will hold against the inner surface of the cores and slowly drive the cores away from the circumference of the roller 48 thus locking the core 46 opposing the two surfaces 50, in Figure 9.

In Figure 1 the take-up roller is driven through the pulley 51 and the belt 52 from the motor 53 mounted on the upright frame 2.

Previous to being placed at the cores the material under the surface is adhered to the cores 46.

In Figures 18 to 23 are illustrated a modified form of the invention in which a pinking cut is required instead of the straight cut. All similar details to the original form have been given the same reference numerals. The exceptions being the pressure roller 55 instead of having tapered slots, hits a surface on which fits the circumference 57 of the cutters 58. The followers and the cutters are similarly mounted on their respective shafts and again can be set in any desired widths. In this form, however, the cutter shaft 30 is not to be driven. To provide for this, a clutch 59 is employed, mounted onto the motor shaft 41. The pulley 60 is thus disengaged with the belt 61 which will idle the said belt, thus idling the shaft 30. The arm 16 is lowered by turning the screw 15, thus bringing the pressure roller 55 into a lower position in front of the members 58. The pressure roller 55 against the cutters 58 will be sufficient to make the desired cut into the material as it is being drawn between them by the action of the driven take-up roller 10. In Figure 20, I illustrate a plurality of cores 62 as they are placed onto the take-up roller 10 with sufficient spacing between each core to prevent overlap of adjacent strips.

Figures 21 and 22 illustrate a cutter 58 with the serrated circumference 57. This design results in the conventional pinked edge 63 of the materials C as shown in Figure 23 forming the strips D.

The take-up shaft 10 must be easily demountable. To provide for this, in Figure 1 the pulley 51 is mounted on a stub shaft 65, which runs in the bearing 64. The right end of the stub shaft is slotted at 66 to fit over a pin 67 extending through a bore 68 of the end of the shaft 10. The opposite extremity of the shaft 10 is turned down and runs in the bearing 9. When the shaft 10 must be taken off, the spring 9' is compressed by pushing against the said spring 9', disengaging the pin 67 from the slot 66 consequently freeing the shaft 10. When the cores 62 pressure contact the shaft 10, the pressure roller 55 will be driven by the shaft 10 by means of frictional contact for the purposes of pinking.

In Figure 24 is shown a modified form in which a double tapered rotating shaft E is placed against the cloth A below and forward from the supporting shaft 8, the tapers going from high points at the center 70 and 71 down to the outside diameter of the take-up roller as at 72. This facilitates keeping the rolled on material from folding, creasing or rolling unevenly before slitting.

The double-tapered rotating shaft shown in Figure 24 at E may be used on the round cutting knife blade or on the pinking wheel cutter.

The cutting edge on the cutter 20 is shown for purposes of illustration but varied edges on the cutter may be ground.

Although the drawings and specification disclose the use in which I have embodied my invention, I do not desire to be limited to the details of such disclosure as changes in form and proportions may be made as circumstances require, without departing from the spirit of my invention within the broad scope of the appended claim.

What I claim as new and novel is:

A machine for slitting sheet material fed from a supply roll, comprising a main frame adapted to support a roll of supply material, a plurality of idler rollers rotatably supported by said main frame adapted to guide said material, a tilting frame pivotally supported by said main frame, means on said tilting frame for guiding said sheet material as it passes from said idler rollers, a cutter shaft provided with a plurality of spaced circular cutting knives rotatably supported on said tilting frame, means for rotating said cutter shaft carried by said tilting frame, an adjustable pressure shaft rotatably supported by said tilting frame and adapted to bear against the blades of said cutter shaft, said pressure shaft being provided with a surface of scorable material adapted to be scored by said blades whereby material passing between said cutter and pressure shafts is slit thereby, a rotatable take-up shaft supported by said main frame adapted to receive a core of scorable material whereon the slit material is to be wound, said tilting frame being adapted to be tilted toward said take-up roller and to score said core material thereon and to be tilted away from said take-up roller during the operation of the machine to maintain the supply material in taut condition as it is wound on said take-up roller.

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