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TAPE SLITTING MACHINE

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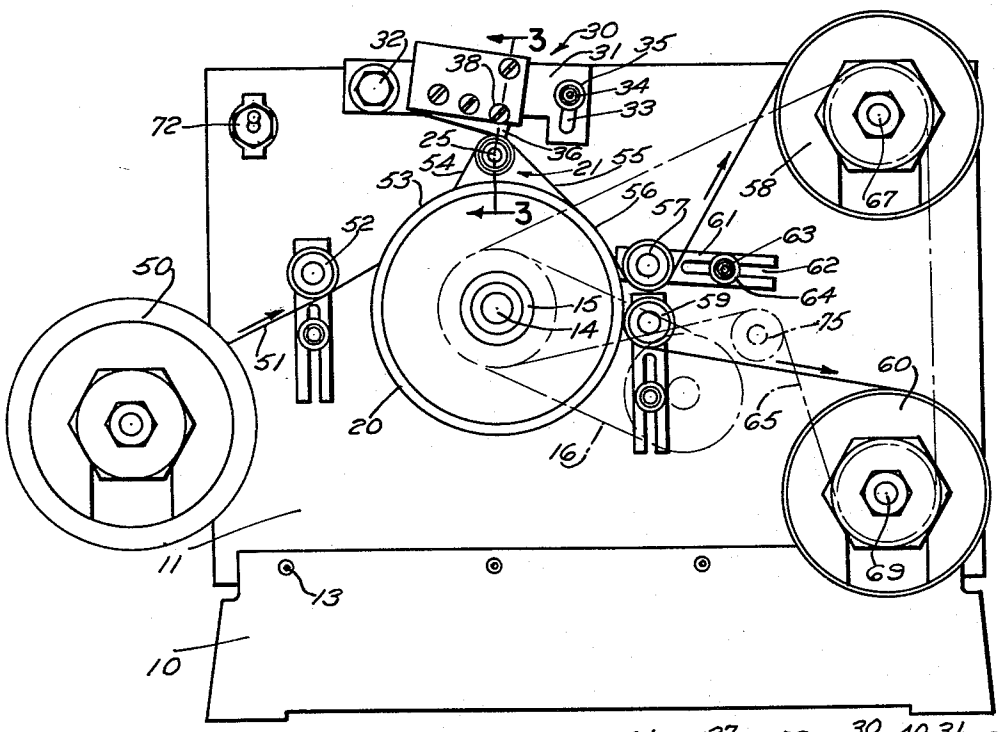


FIG. 1

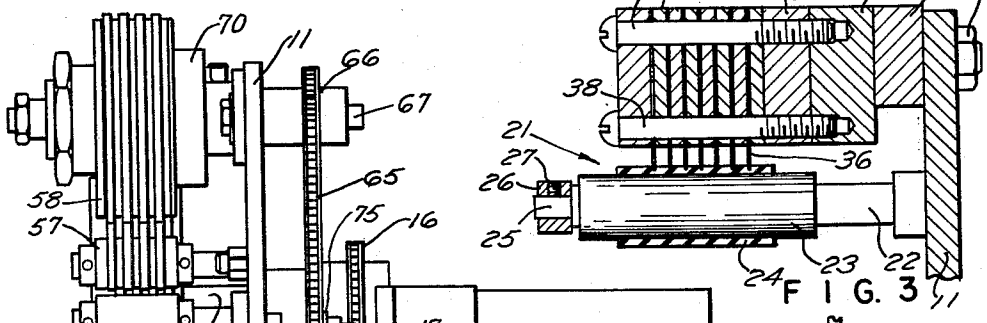


FIG. 3

FIG. 2

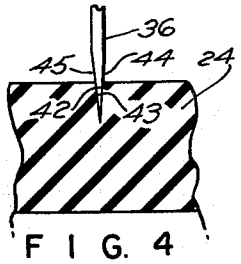


FIG. 4

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TAPE SLITTING MACHINE

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This invention relates to a slitting machine for webs or tapes which webs or tapes may or may not have an adhesive surface.

Heretofore, in the slitting of webs or tape, the tape has been supported between spaced supports such as rolls, and the slitting knife or knives have been made to cut through the web or tape between these two spaced points of support. In so doing, the knife projects from one side of the tape and is unsupported on the other side of the tape, thus giving rise to the posibility of either the tape or the knives varying somewhat from a straight line path with reference to the tape so that the tape has a wavy or fuzzy edge, and this is especially prominent when the knives are somewhat dull.

One of the objects of this invention is to provide a method and apparatus for cutting which will avoid the wavy edge or fuzzy edge which has heretofore occurred.

Another object of this invention is to better support the relative position of the knives and the web or tape which is to be cut thereby so that a straight line travel of the web or tape with reference to the knives may be had.

More specifically, an object of this invention is to support the cutting knife on both sides of the tape and provide a surface to well support the tape so that an accurate or precision cutting may be had.

Another object of the invention where tape has an adhesive surface is the utilization of the adhesive surface for holding the tape in position with reference to the knives.

A further object of the invention is to utilize the adhesive surface of the tape for feeding the tape to and from the location of the cut by some traveling surface on either one or both sides of the location of the cut.

With these and other objects in view, the invention consists of certain novel features of construction as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings:

FIG. 1 is an elevation looking at the front of the machine;

FIG. 2 is an end view looking at the right-hand end of FIG. 1;

FIG. 3 is a sectional view on a larger scale and on substantially line 3—3 of FIG. 1; and

FIG. 4 is a greatly enlarged sectional view showing a knife penetrating the tape backup roll.

In proceeding with this invention, we have utilized a driven surface on either side of the location of cutting of the web to drive the web through the location of the performance of the cutting action, and the location of cutting action we have provided a traveling surface which is soft and resilient to support the tape, and we have applied cutters to the tape at this location so as to cut through the tape and into this soft resilient surface to provide a track therein for each of the cutters which are utilized. Thus each cutter snugly fits its track and, being of a thin character, passes through the web and into this track where it is guided on either side by the walls of the track so that a perfectly straight line cut is performed in the web.

With reference to the drawings, 10 designates a base of the machine upon which there is mounted an upright supporting plate 11 such as by means of a groove 12 into which the plate fits and is secured by the passage of screws 13 through the walls of the slot 12. A shaft 14 is mounted in a suitable bearing 15 in the plate 11, and this shaft is driven by a sprocket chain 16 extending over sprocket gear on shaft 14 and also over sprocket gear on shaft 17 driven through a reduction gear in casing 18 from an electric motor 19 so as to provide a source of power for the main shaft 14. Upon this shaft 14 a drum 20 is fixed to be driven by this shaft, which is the main feeding drum of the machine.

The back-up surface for the tape may be any traveling surface but is here illustrated as a back-up roll 21 which is mounted upon a shaft 22 at such location that the surface of the back-up roll 21 is spaced from the surface of the drum 20. This roll 21 consists of a metal core 23 having a soft resilient covering 24 embracing the same and fixedly secured thereto. This roll 21 is mounted to loosely revolved upon this shaft 22 which is reduced at its outer end as at 25 and provided with a collar 26 having set screw 27 to prevent the roll from moving off the end of shaft 22. Although this back-up roll is loosely mounted on the shaft 22 for rotation, it might be driven at the same surface speed as the drum 20 should occasion require.

A cutting unit designated generally 30 is mounted on the plate 11 above this roll on an arm 31 which is pivoted as at 32 on the plate 11 and which may swing about this pivot to different locations where it may be held by means of slot 33 and screw 34 with washer 35 beneath its head which screw 34 is threaded into the plate 11 and serves to bind the arm in adjusted position at any location along this slot. Upon this arm 31 there is mounted a plurality of cutting blades 36, which in this present instance are seven Gillette razor blades, with spacing units 37 between these blades. We have here illustrated seven of such blades to provide eight strips of material from the web fed in. These blades are held in secure position by a plurality of screws 38, 41 passing through openings in the blades and into the mounting blocks 39 and 40 which are secured to the arm 31. In the operation of the machine the arm 31 is swung about its pivot 32 so as to cause the cutting blades 36 to enter the surface of the soft material 24 (see FIG. 4) such as rubber or rubber-like material of the roll 21 and provide its own track therein with opposite walls 42 and 43 which will snugly engage the opposite side walls 44 and 45 of the cutting blade and thus serve to guide it. It will be understood that the blades may be rotary disks if desired.

A web supply package 50 is mounted for rotation through some sort of a friction clutch so as to control the same by means of some tension, and the web or tape 51 is lead from this supply package to the feeding drum 20 beneath the idler roll 52. In some cases where the tape has no adhesive, the idler will be adjusted to provide a long arc of engagement to establish sufficient friction for feeding the tape. In this case the tape has an adhesive surface which adhesive surface faces away from the roll 52 so that the adhesive surface will engage the surface of the feed drum 20 along the short arc 53 thereof. The web will leave this surface of this feed drum and extend along the portion of its travel 54 to the back-up roll 21 and thence pass along the surface of the back-up roll with its tacky surface in engagement with this back-up roll to prevent lateral slipping and beneath the cutters 36. From the cutters the web will extend along the portion of its travel 55 back to the surface of the feeding drum along the arcuate section 56 thereof, which sections 55 and 56 of the tape will be at that point slit into a plurality of strips, in this case eight, there being seven cutters provided, and then the strips will be separated, alternate strips being passed about the idler roll 57 to the take-up roll 58 while intermediate the strips passing beneath idler roll 57 there will be other strips passing

about the idler roll 59 and thence to the take-up package 60. Each of these idler rolls is mounted upon brackets 61 slotted as at 62 and secured in various positions of adjustment by reason of screw 63 holding a washer 64 against the bracket which forces the bracket against the plate 11. Here again the idler rolls 57 and 59 may be adjusted as to position to provide a longer arc 56 to establish sufficient friction for feeding of the tape through the cutters. Each of the take-up rolls 58 and 60 is driven by a sprocket chain 65 embracing sprocket gears 66 on shaft 67 upon which take-up roll 58 is secured and embracing sprocket gear 68 upon shaft 69 upon which take-up roll 60 is mounted, this sprocket chain 65 extends over a take-up idler 75 and is driven by embracing a sprocket gear on shaft 14 which is the main drive shaft of the machine. Each of these take-up rolls is driven through friction clutches 70 and 71 adjusted as to spring tension so as to maintain the same driving force on each of the take-up rolls although allowing some slippage to occur as the packages build up in diameter. A suitable toggle switch at 72 may be provided for control of the motor 19 to stop and start the same.

We claim:

1. In a tape slitting machine a back-up roll, a cutter extending into said roll, means to feed a tape from a support to said back-up roll and said same means assisting in feeding from the back-up roll to a take-up reel, said means to feed comprising a drum of a greater diameter than said back-up roll and in close proximity to and spaced from the back-up roll whereby the tape may engage the surface of said drum for a segment of its surface, then extend from the drum to the back-up roll and then return to the drum to engage a segment of its surface.

2. The method of slitting tape which comprises supporting the tape on a relatively soft rotary repeating surface, advancing the tape and soft surface simultaneously and slitting the tape by passing a thin fixed knife through the tape and into the soft supporting rotary surface to form a track therein of a sufficient depth to form side walls to guide the cutter as they both advance relative to the blade.

3. The method of claim 2 wherein there are a plurality of thin fixed knives laterally spaced with reference to the longitudinal travel of the tape, and a plurality of cuts are performed at the same time.

4. The method of slitting tape which is adhesive on one surface and which comprises supporting the tape on a relatively soft rotary surface, feeding the tape to and from the soft surface by an advancing surface to which the adhesive surface of the tape will adhere and slitting the tape by passing a thin fixed knife through the tape and into the soft rotary supporting surface to form a track therein.

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