June 4, 1963 G. A. BEERLI 3,092,343

TAPE DISPENSER

Filed Aug. 22, 1958 3 Sheets-Sheet 1

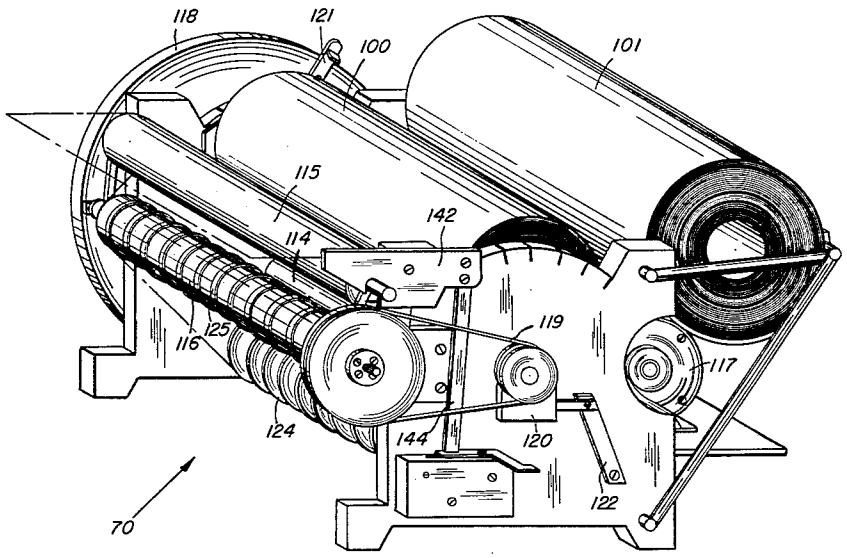


FIG. 1

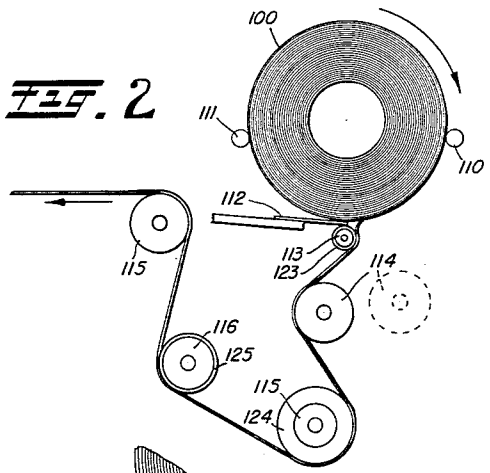


FIG. 2

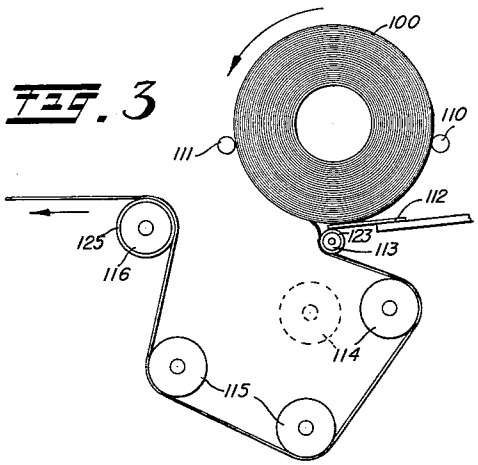


FIG. 3

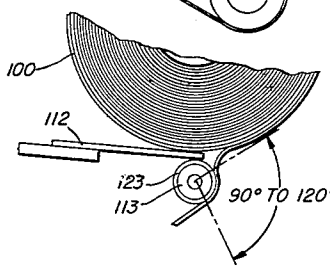


FIG. 4

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TAPE DISPENSER

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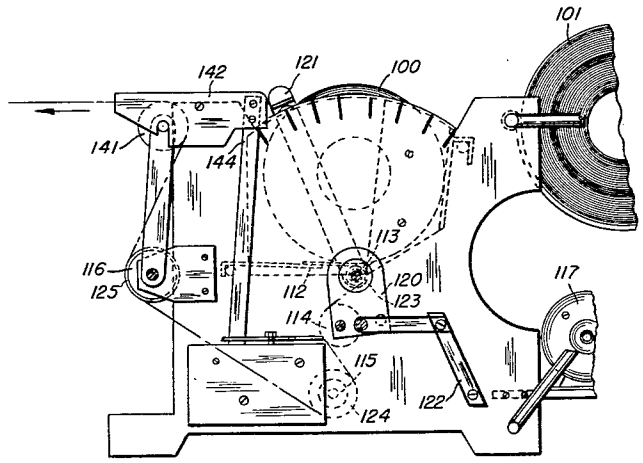


FIG. 5

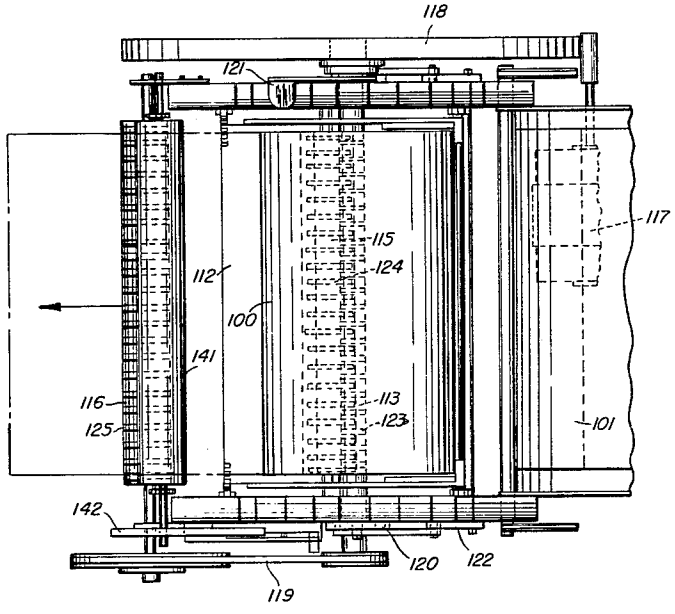


FIG. 6

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TAPE DISPENSER

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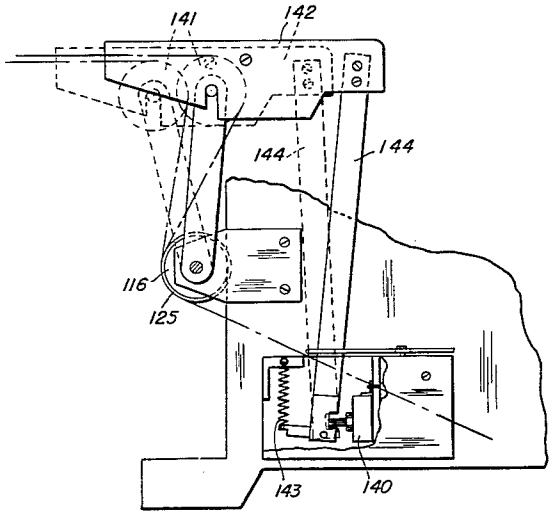


FIG. 7

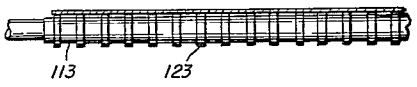


FIG. 9

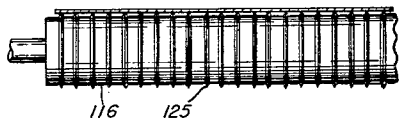


FIG. 10

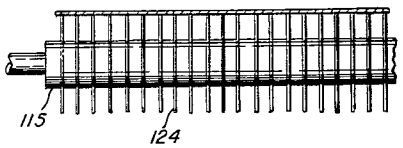


FIG. 11

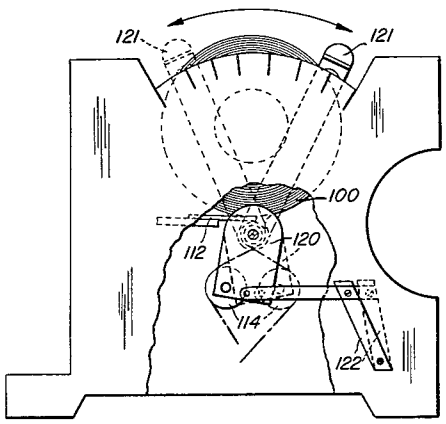


FIG. 8

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TAPE DISPENSER

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Filed Aug. 22, 1958, Ser. No. 756,732
3 Claims. (Cl. 242—55)

This invention relates to an apparatus for automatically applying pressure sensitive tape and finds particular use in splicing together the abutting edges of two webs.

In the past few years, there has been introduced a new type of vinyl plastic floor covering which is produced by printing a design by a rotogravure press on a web of felt impregnated with a water-proofing agent and then coating the printed web with a wear resistant clear vinyl layer. The average room is of substantial dimensions and, therefore, such a floor covering requires rotogravure printing presses having a width of at least nine feet and usually twelve feet.

Heretofore, it has been necessary to splice a new web to an exhausted web by hand, which has necessitated either the temporary stopping of the press so that the webs are stationary during the act of splicing or by utilizing festooners creating enough supply of material to continuously feed the web while the succeeding portion of the web is stopped to complete the splice. Because the speeds of modern rotogravure presses range from 200 to 400 feet a minute and higher, it is necessary to have festooners of gigantic proportions in order to store sufficient material to keep the press in operation while the splice is being made by hand. If the press is slowed down or stopped, color registry is lost and, since the usual rotogravure press involves five or six color units, a substantial amount of material is wasted.

Machines are presently available for use in the box board industry and the like for automatically splicing a new roll of web material to the end of an exhausted roll by means of pressure sensitive tape wherein the webs are usually about two to four feet wide. These machines, however, are not readily adapted to splice webs which are substantially wider. The primary failure of such splicing machines is the difficulty in supplying a sufficient length of pressure sensitive tape to produce the splice in the short period of time which is available. The desirability of having an apparatus for automatically splicing a new roll of wide web material to an exhausted roll in a short period of time is readily apparent.

An object of the invention is to provide an apparatus for automatically storing and supplying tape to a web splicing machine. A further object of the invention is to provide a means for making the desired length of tape necessary to complete such a splice available in a rapid and simple manner.

These objects are accomplished by providing a tape dispenser which can be used with a web splicing machine which includes clamps which hold the leading end of the new web on top of the terminal end of the exhausted web in a stationary position, a carriage which traverses across the webs carrying one unit on top of the overlapped webs and another unit underneath the webs comprising the pressure sensitive tape dispensers, tape storing devices for storing the pressure sensitive tape supplied from the tape dispensers, opposing shearing cutters for cutting the web, scrap removers for removing the waste ends cut off and tape applicator rolls for aligning the webs and pressing tape over the abutting ends of the cut webs.

In operation, each tape dispenser delivers pressure sensitive tape to its associated storage device which will store in a ready manner sufficient tape to cover the width of the web. When the machine is ready for operation, the

leading end of a new web is placed over the terminal end of the old web, the clamps applied to clamp the webs in aligned relationship, the splicing device traverses the webs first shearing both webs, then removing the scrap ends of each web and then pressing the tape supplied from the tape storage device against the butt ends of the web to complete the splice.

The invention will be better understood by the following detailed description when read in accompaniment with the drawings in which:

FIG. 1 is an oblique view of one embodiment of the tape dispenser used in feeding tape for the web splicing operation.

FIG. 2 and FIG. 3 show schematically two methods of feeding tape through the tape dispenser.

FIG. 4 is an enlarged view showing the wrap necessary on the peeler roll for peeling the tape from the roll to feed the tape uniformly to the tape storage device.

FIG. 5 is a side elevational view of the tape dispenser with the pulley sheaves removed to show the associated mechanisms more clearly.

FIG. 6 is a plan view of FIG. 5 with the pulley's belt shown.

FIG. 7 is a side elevational view of the tension detector drive control unit on the tape dispenser.

FIG. 8 is a side elevational view showing the wrap control idler and positioning levers.

FIGS. 9, 10 and 11 are front elevational views of the peeler roll and grooved idler rolls showing the contact of the adhesive side of the tape.

The automatic web splicing apparatus is able to function because of the utilization of an automatic tape dispenser illustrated in FIGS. 1 to 11. The tape dispenser **70** has a rack for holding a roll **100** of pressure sensitive tape formed by two rods **110** and **111** located on each side of the roll of tape **100** and a flat rest guide **112** located at the base of the tape roll **100** and on which the tape roll rests. The tape is pulled off of the supply roll by a peeler roll **113** located below the guide member. The tape is preferably pulled from the roll at a tangential angle to reduce the possibility of breaking. In the embodiment illustrated in the drawing the drive roll **113** is located as close to the roll of tape as possible. This arrangement greatly facilitates the pulling of the tape from the supply roll and reduces any possibility of the tape breaking. The rest guide member **112** on which the tape roll rests separates the tape roll from the drive roll and thereby prevents damage to the tape roll. The rest guide should be as thin as structurally possible and preferably made of a material which will resist wear and to which the tape will not readily stick. Such a material is "Teflon" which is a tetrafluoroethylene polymer. It is necessary for the tape to have from about 90° to 120° wrap about the peeler roll **113** with the sticky side of the tape contacting the peel roll to allow positive removal of the tape from the roll without danger of breaking. In this arrangement, the tape is pulled from the roll by the peeler roll at a substantial tangential angle to the roll. This angle of removal substantially reduces any tendency of the tape to break since it only exerts minimum force in the direction of the weakest part of the tape.

The desired wrap about the peel roll **113** is obtained by means of a wrap control idler roll **114** which guides the tape from the peeler roll. As shown in FIG. 2, the tape is delivered with the adhesive side up by placing the roll of tape in the dispensing rack so that the roll revolves clockwise as it is unwound. When it is desired to deliver the tape with the adhesive side down, the roll of tape is placed in the rack so that it unwinds in a counter clockwise direction with the guide **112** located so that it

extends between the roll and peel roll from the opposite side. The guide roll **114** is adjusted so as to maintain the desired wrap about the peeler roll **113**. The tape dispenser is constructed so that the rest guide **112** and the wrap control idler roll **114** can be reversed, and therefore makes possible the adaption of one dispenser to deliver the tape with the adhesive side facing up or down. The tape is passed from the wrap control idler roll **114** over other guide rolls **115** to deliver it to the point desired. It is preferred to have an additional drive roll **116** located in the path of the tape travel to aid in supplying it positively with a minimum of tension. This roll also has the function to pull the tape off the peeler roll. The peeler roll **113** is driven from motor **117** which contacts a driving drum **118** affixed to one end of the peeler roll **113**. The additional drive roll **116** can be driven from the first drive roll **113**. It is preferred for the second drive roll to be driven at a slightly faster speed than the first drive roll to aid in the removal of the tape from the peeler roll. With such an arrangement the belt type drive allows slippage to avoid exerting too much tension on the tape.

The wrap control idler roll **114** is mounted on a movable bearing to allow it to be swung from one side of the drive roll to the other depending on whether the tape is to be delivered with the sticky side up or down. This can be conveniently accomplished by use of a concentric plate **120** attached to a lever arm **121** and which pivots about the shaft of the drive roll. The wrap control idler roll **114** is moved through an arc by moving the lever arm **121**. In this manner the amount of wrap of the tape about the peeler roll can also be controlled. In order to assure smooth movement of the wrap control idler roll a travel arm **122** is provided on a concentric plate affixed to the end of the roll opposite the lever arm **121**. The tape dispenser is capable of delivering to the storage device a tape six inches wide under substantially no tension.

The peeler roll **113** preferably has flat rings **123** about its periphery at spaced intervals to minimize the contact of the tape with the roll to prevent undue sticking. It is essential, however, for the roll to have sufficient contact area to pull the tape off of its supply roll. The guide members which contact the adhesive side of the tape in one embodiment are made up of a series of spaced circular discs **124** mounted on a common shaft. Such construction minimizes contact with the adhesive on the tape and therefore prevents drag and undue tension on the tape. Alternately, the guide rolls can be a roll having a series of spaced grooves **125** about its periphery.

The tape dispenser is actuated through a control switch **140** which turns the tape dispenser drive motor on and off. The switch **140** is actuated to turn the drive motor on when tension is placed on the tape as it leaves the dispenser. This tension pulls guide roll **141** forward which causes assembly **142** to move forward thereby actuating switch **140** to start the drive motor. When the storage device is full, the tension on the tape is released and the assembly **142** moves backward thereby turning the motor off. The assembly **142** is held in the off position by slight pressure of a spring **143** which pulls on pivot arm **144** connected to a horizontal bracket which supports the movable guide roll **141**.

Various other modifications of the invention as disclosed above and illustrated in the drawings which are within the spirit and scope of the invention will occur to persons skilled in the art.

What is claimed is:

1. A pressure sensitive tape dispenser comprising a cradle for holding a roll of pressure sensitive adhesive tape, a thin flat guide for supporting and remaining in contact with the roll of tape, a peeler roll located in juxtaposition to the tape roll and in contact with said flat guide for peeling the tape from said tape roll at a substantially tangential angle to said tape roll, means for maintaining constant the distance between the peripheries of said peeler roll and said roll of tape, a wrap control idler roll for guiding the adhesive side of the tape in contact with said peeler roll, the frictional contact of said adhesive side of the tape with said peeler roll being sufficient to allow peeling of the tape from the roll by rotating said peeler roll and means for rotating said peeler roll thereby peeling the tape from the roll.

2. The pressure sensitive tape dispenser of claim 1 which includes a drive roll over which said tape will pass to operate in conjunction with said peeler roll thereby preventing said tape from remaining on said peeler roll and a means for rotating said drive roll.

3. A pressure sensitive tape dispenser comprising a thin flat guide for supporting and remaining in contact with a roll of pressure sensitive adhesive tape, a peeler roll in contact with said guide for peeling the tape from the roll at a substantially tangential angle to said tape roll and an adjustable wrap control idler roll for holding the adhesive side of the tape in contact with said peeler roll through an arc of said peeler roll sufficient to faciliate removal of the tape from the tape roll by the frictional contact of said adhesive side of the tape and said peeler roll by rotating said peeler roll, a drive roll over which said tape will pass to operate in conjunction with said peeler roll thereby preventing said tape from remaining on said peeler roll and a common means for rotating said peeler roll and drive roll, said drive roll being driven at a slightly faster speed than said peeler roll.

References Cited in the file of this patent

UNITED STATES PATENTS

1,398,984	Voth	Dec. 6, 1921
1,811,460	Eaton	June 23, 1931
1,972,851	McCarthy	Sept. 4, 1934
2,012,014	McCarthy	Aug. 20, 1935
2,252,028	Petskeyes et al.	Aug. 12, 1941
2,325,063	Krueger	July 27, 1943
2,536,066	Krueger	Jan. 2, 1951
2,564,901	Hess	Aug. 21, 1951
2,573,912	Krueger	Nov. 6, 1951
2,606,136	Garrett	Aug. 5, 1952
2,643,017	Mack	June 23, 1953
2,772,838	Lenz	Dec. 4, 1956
2,795,264	Pechy	June 11, 1957