

Intermix Splicing of Triacetate to Polyester Base Film by Means of a High Temperature Adhesive Strip

By LEONARD A. HERZIG

A method for intermix splicing of triacetate to polyester base film is described, using the process of heat and pressure, and applying automatically a strip of reinforcing high-temperature thermal-setting tape to both sides of the film. This method may be used for all types of safety base film. The splice is stronger than the film itself.

Film splicing has presented a serious problem for many years in both the micro-film and motion-picture fields. To date, Prestoseal's various models of the "Presto Splicer" have been capable of handling butt-weld splicing of triacetate to triacetate or acetate film, and the splicing of polyester base to polyester base film.

Today's problems, however, differ considerably as it becomes more apparent that the intermixing of triacetate base film with polyester base film is imminent. The only means available is the use of pressure-sensitive tapes. After studying these problems, it was obvious that other solutions for splicing intermixed bases were required which would not have the difficulties inherent to pressure-sensitive tapes.

During a period of five years, Prestoseal has tested many high-temperature thermal-setting adhesives in its Research Laboratory and finally has chosen one which could be coated on Mylar, was compatible to all present types of base materials (such as triacetate, acetate and polyester), and by its application as a bonding strip made the splice the strongest part of the film.

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Once the material became available, the need for a precise apparatus to position accurately this bonding strip of reinforcing material had to be designed and built. The new "Hercules Model" of the Presto Splicer fulfills this requirement.

The "Hercules Model" is an improved version of the Miracle Model butt-weld splicer, with an adapter for automatically pre-cutting a sliver to be used for splicing of dissimilar materials. It allows the sliver material to be positioned on both sides of the film or on one side of the film only. The total time for completing a splice is 15 sec.

Operation

Figure 1 shows the sliver being pulled through the sliver clamps. After the sliver is pulled through the third and final sliver clamp, it is automatically cut to length.

In Fig. 2 the sliver clamps have automatically been released after the sliver was cut. By centrifugal force half of the clamp has folded into an upright position while the other half of the clamp has positioned itself on the heater block. After having cut the film to be spliced, the film clamps are positioned over the heater block. This automatically folds the silver holder still further until the sliver covers the top of the film to be spliced. The film is now sandwiched in between one sliver that is wrapped around both sides.

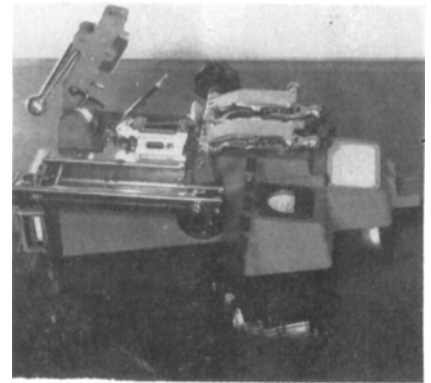


Figure 2

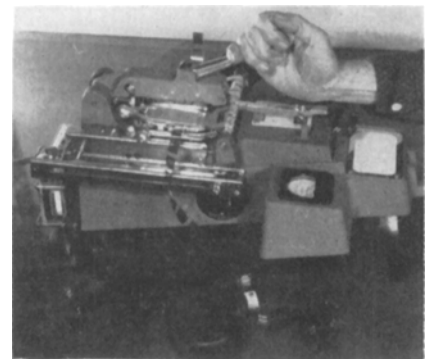


Figure 3

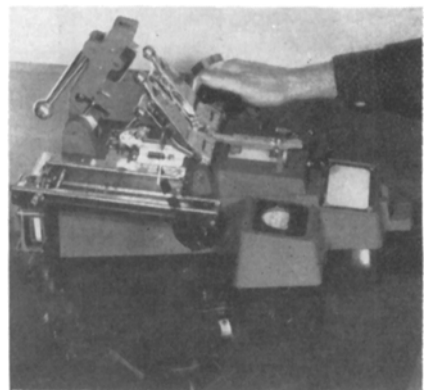


Figure 4

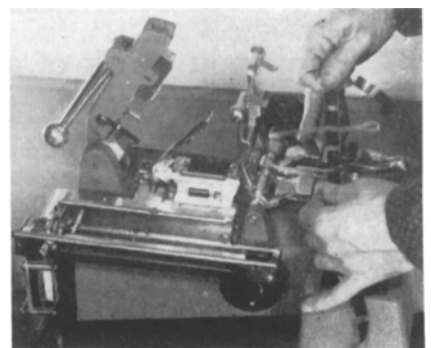


Figure 5

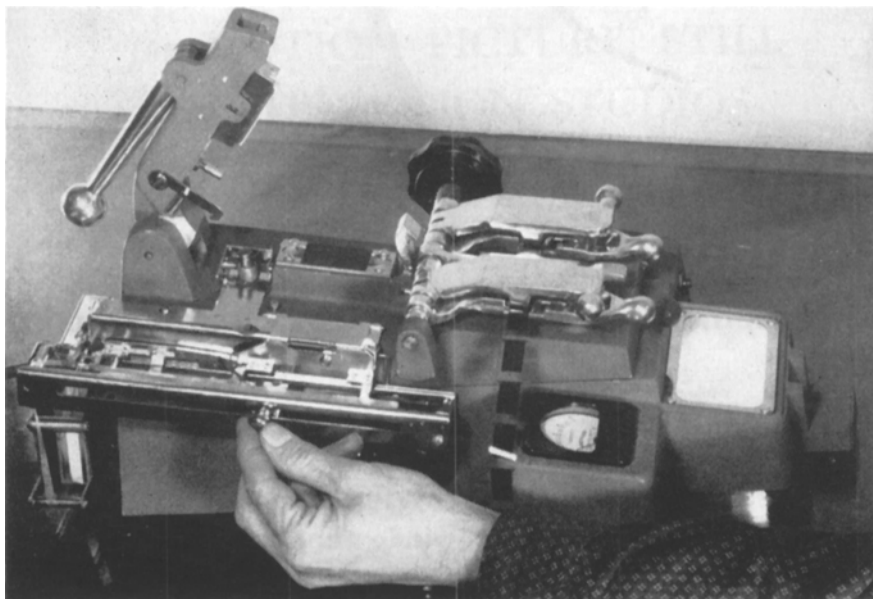


Figure 1

Figure 3 shows the pressure being applied at the same time the machine is placed through the heat cycle.

In Fig. 4 the splice has been completed after the pressure has been released, and the clamps are being repositioned to the forward unclamp position.

Figure 5 shows the film as it is removed from the clamps, with the bonding strip fastened to the film. Its surplus will be trimmed off with an external trimmer (not shown).

Performance

The sliver material is 0.003 in. thick and 0.100 in. wide and is packaged in a cartridge and mounted on the back of the splicer. The cartridge contains four 225-ft rolls of material. When a new spool of sliver material is required, it can be threaded automatically in a matter of seconds.

The application of a sliver 0.003 in. thick by 0.100 in. wide to both sides of 0.006 in. film would normally make a total thickness of 0.012 in. However because of the application of heat and pressure, the sliver is compressed into the film and results in a total thickness, including the film, of 0.011 in. or less. Film that is bonded by this method has recently been tested on a Scott Tensile Tester, and at no time has ever let go. In all cases the film itself has either broken, or stretched before breaking, at other than the spliced area.

This type of bonded splice lends itself uniquely to the Recordak "Lodestar" reader, where a Mylar leader stock needs to be fastened to an acetate or Cronar base film, and the splice must be capable of withstanding winding and rewinding shocks. When trimming the surplus material from the splice, the trimmer undercuts the film slightly to prevent any material interfering with the film while it is in motion.

When similar bases are spliced together the reinforcing strip need not be used, although there are times when reinforcing the standard splice becomes a requirement. In these instances a sliver on one surface only need be applied. This allows the base of the film to be fused together with a sliver to act as a reinforcing bonding agent.

Advantages

The reason for using two slivers on dissimilar bases (one on each side) of the material to be spliced is that the base materials do not fuse together as they are not compatible. Therefore, in reinforcing both sides of the film with a bonding strip, there is no tendency for the film to collapse as would be indicated where just one sliver was used. This does not occur, however, when using similar base materials for the following reasons:

- (1) The base materials bond to each other, creating a homogeneous splice.
- (2) The sliver reinforces this bond with its own bond, adding to its strength.

The splice is so strong that when the spliced section of the film to the leader stock comes out of the dryer, the splice cannot be torn and must be broken off on both sides of the splice. Other advantages of this splice in the darkroom are that no runoff of developer or hypo occurs from liquid being trapped, as previously occurred where staples, rivets, etc., were used; and the splice will not tear or injure squeegees when they are used in processing equipment.

Application

The following is a list of some of the fields to which the application of this reinforced splice lends itself:

- (1) *Microfilm*: Lodestar Reader, darkroom processing, and permanent records—negatives and prints.
- (2) *Motion Pictures*: reclaiming of raw stock, processing, continuous printing, lip synchronization, and release prints.
- (3) *Magnetic Tape*: sound recording, instrumentation (information retrieval), computer, reclaiming materials, and video tape.
- (4) *Punched Paper Tape*: automatic printing, instrumentation, and computer.

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Prepared by a Special Subcommittee of the Laboratory Practice Committee of the Society of Motion Picture and Television Engineers

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Foreword by E. H. REICHARD
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CHAPTERS

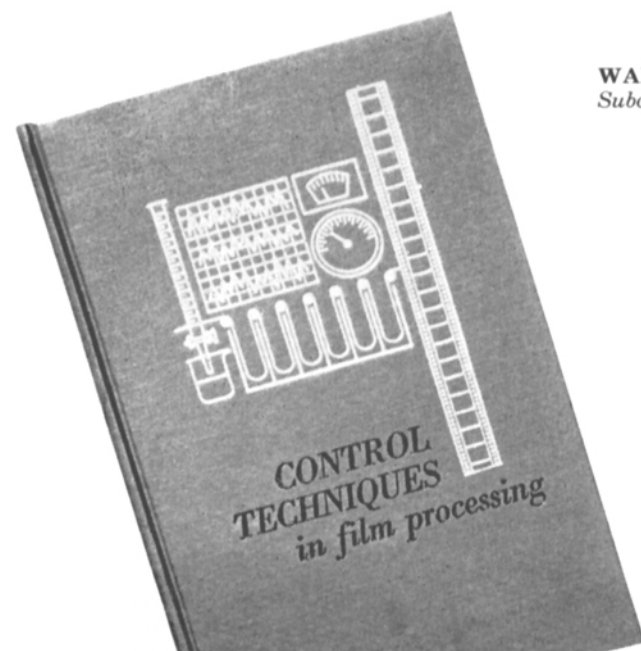
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