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Ida et al.

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[54] **DEVICE FOR USE IN TENTER TYPE STRETCHER FOR PREVENTING THE TORN-OFF EDGE OF FILM FROM RUNNING OFF THE NORMAL PATH**

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[30] **Foreign Application Priority Data**

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[52] **U.S. Cl.** **198/180,** 198/179

[51] **Int. Cl.** **B65g 19/00**

[58] **Field of Search** ..... 198/180, 179; 271/74 PG

[56] **References Cited**

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[57] **ABSTRACT**

A device for use in a tenter type stretcher is provided for preventing the torn off edge of the film from running off the normal path, said device comprising a liner consisting of a flat portion having a length and width sufficient for clipping a film thereon, and a tongue extending from said flat portion upwardly, and a clip lever pivotted to a clip body adapted for mounting said liner thereon, whereby the torn-off edge of the film, if it so happens when stretched laterally, may be prevented from running off the normal path behind said clip at the exit of the stretcher, said film being liable to be occasionally torn off lengthwise and made of a thermoplastic resin. (Such a film will be referred to as a film hereinafter).

1 Claim, 7 Drawing Figures

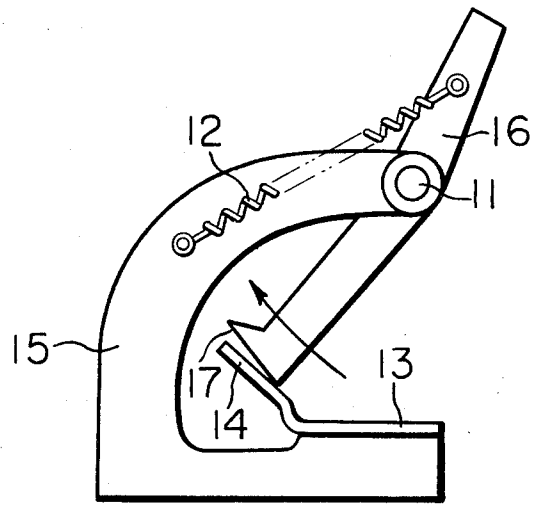


FIG. 1 (a)

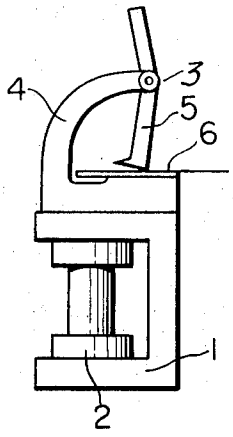


FIG. 1 (b)

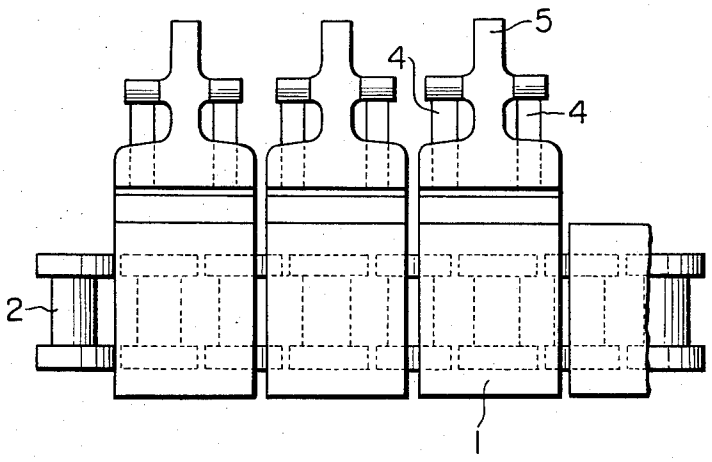


FIG. 2

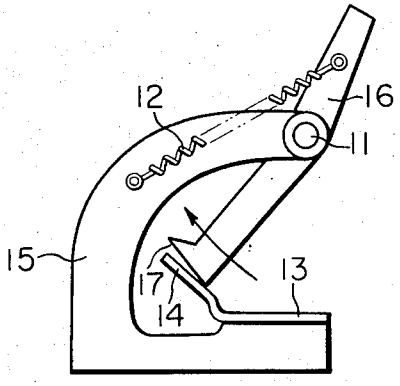


FIG. 3 (a)

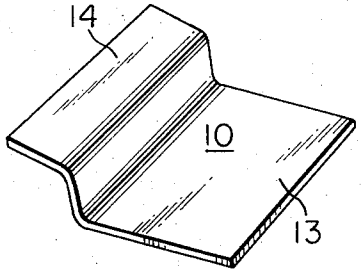


FIG. 3 (b)

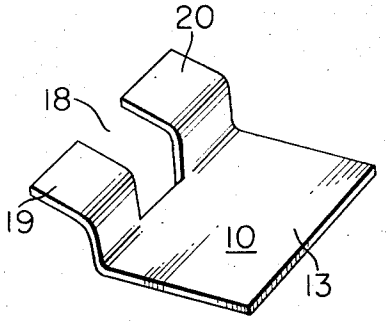


FIG. 4

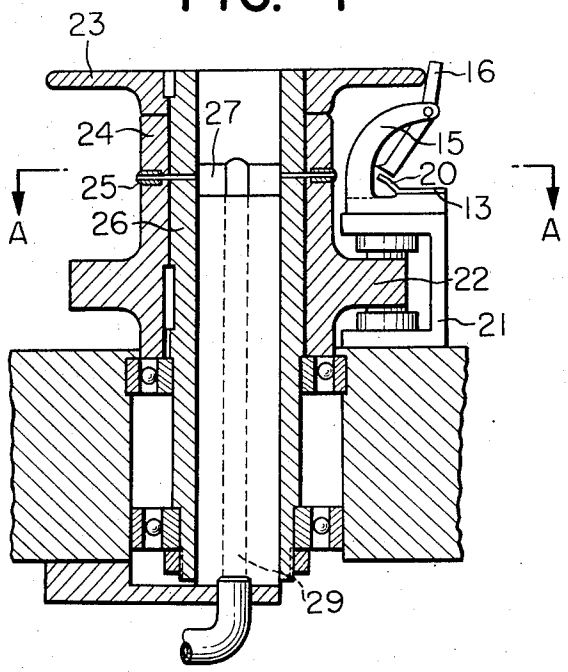
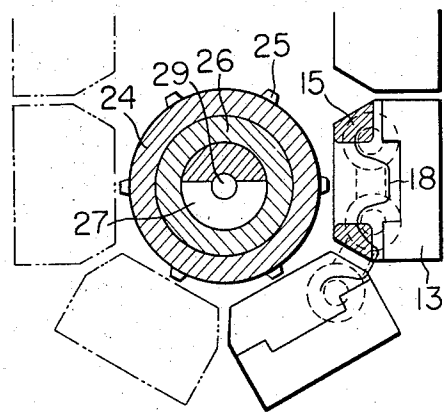


FIG. 5



DEVICE FOR USE IN TENTER TYPE STRETCHER FOR PREVENTING THE TORN-OFF EDGE OF FILM FROM RUNNING OFF THE NORMAL PATH

BACKGROUND OF THE INVENTION:

The present invention, relates to a device for use in a tenter type stretcher for preventing the torn-off edge of a film from running off the normal path, said device comprising a liner consisting of a flat portion having a length and width sufficient for clipping the film and a tongue extending from said flat portion upwardly, and a clip lever pivotted to a clip body adapted for mounting said liner thereon, whereby the torn-off edge of the film may be prevented from running off behind said clip lever at the exit of a stretcher or for readily removing said torn-off film therefrom while a film is stretched laterally, said cut-off film being liable to be occasionally torn-off lengthwise.

BRIEF DESCRIPTION OF THE PRIOR ART:

A clip for use in the conventional tenter type stretcher is of a type wherein a clip (3) is mounted, as shown in FIG. 1, on an endless run of chain (1) and (2), said clip (3) consisting of a clip body (4), clip lever (5) and a liner (6) mounted on said clip body and being adapted to clip a film thereon which is adapted to be stretched laterally, as for example, in biaxial stretching machine.

The film thus clipped by clips at the entrance of a tenter is, while being kept clipping transferred into air oven so as to be heat stretched under moderate temperatures, and is stretched lateraly in said oven. At the exit of a tenter the film is then released from said clip lever (5) by raising clipping lever to the arrow direction as shown thereby leaving said clip (3), so as to be transferred to the subsequent steps such as for taking up the film stretched.

There are, however, accidents of such a film being torn-off lengthwise within the oven due to various stretching conditions, such as stretching temperatures or conditions of the film being stretched in a manner aforesaid. The lengthwise tearing-off of said film, in some cases, tends to take place in the form of a narrow ribon or strip, said tearing-off mostly originating from the portion of the film, on which the film is being clipped by means of the clip lever.

Frequently, when the clip lever releases from clipping operation at the exit of the tenter, such a torn-off edge of a film in the form of a ribbon tends to run off the abnormal path behind the clip lever with the result that said edge is retained thereat without being transferred to the subsequent steps and thereby returned with the clip to the initial position, i.e., the return side.

More specifically, as can be seen from the construction of the clip body and clip lever, when the clip lever released from the clipping operation by being raised up, there is formed a running in hollow behind the lever, that is, between the lever and the body portion of said clip body, and such a torn-off edge of a film is occasionally liable to run into said hollow. Once the torn-off edge of film runs into such a hollow, it can not be removed from the clip without resorting to troublesome manual operations, such as cutting off such a edge to a certain short length by means of scissors before said edge is transferred with the return clip to the initial position, or by stopping said clip chains, thereby

removing said torn-off edge of film before running into said hollow behind the clip lever.

It is very dangerous to cut off by means of scissors such a film running off behind the clip lever of the clip chains which is also running at a high speed, and in addition stopping the clip chains would lower the production efficiency to a great extent because such an action would unfavorably affect other associated processes.

OBJECTS OF THE INVENTION:

The prime object of the present invention is to provide a device for use in a tenter type stretcher for preventing the torn-off edge of a film from running off the normal path, said device permitting the film to be transferred with said film being borne on the flat portion of the liner by means of the provision of a tongue which is adapted to prevent the torn-off edge of the film on the clip liner from running off from the normal path and then into the hollow behind the clip lever. The secondary object of the present invention is to provide a device for use in a tenter type stretcher for preventing the torn-off edge of a film from running off the normal path, whereby even if the running film is torn-off, the torn-off edge of the film on the clip liner may be rejected toward the flat portion of the clip liner by means of the air under pressure being ejected against a notched portion formed between liner tongues, thereby preventing said torn-off edge of the film from being transferred toward the initial position together with the clip.

BRIEF SUMMARY OF THE INVENTION:

The present invention provides a device for use in a tenter type stretcher for preventing the torn-off edge of a film from running off the normal path, said device comprising a line consisting of a flat portion having a length and width sufficient for clipping a film thereon, and a tongue extending from said flat portion upwardly, and a clip lever pivotted to a clip body adapted for mounting said liner thereon, whereby the torn-off edge of the film, if it so happens when stretched laterally, may be prevented from running off the normal path behind said clip lever at the exit of the stretcher, said film being liable to be occasionally torn-off lengthwise.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS:

FIG. 1 (*a*) is a side elevation of a clip of the conventional tenter type stretcher;

FIG. 1 (*b*) is a plan view of a clip of the tenter type stretcher;

FIG. 2 is a side elevation of a tenter clip of the device of the invention;

FIG. 3 (*a*) is a perspective view of a liner for use in the tenter clip of the invention, showing the liner free of a notched portion;

FIG. 3 (*b*) is a perspective view of another embodiment of the invention showing a liner for use in the present invention;

FIG. 4 is a longitudinal cross-sectional view of a ejection device and an exit chain wheel with mounted a chip in accordance with the principles of this invention.

FIG. 5 is a cross-sectional view taken along the line A—A of FIG. 4.

DETAILED DESCRIPTION OF THE INVENTION:

As shown in FIGS. 2 and 3, there is shown a liner

(10) fixedly mounted on the mounting surface of the clip body (15), said liner (10) consisting of a flat portion (13) having a length and width sufficient for clipping a film thereon and a tongue (14) extending from one edge of said flat portion (13) upwardly. There is provided a gap between the tip face (17) of the clip lever and tongue (14), said gap being formed before the film is clipped or upon releasing of said film and said clip lever being adapted to rotate in an arrow direction as shown. The gap thus formed should be narrower than thickness of the film being clipped at its edge.

The clip lever (16) is pivotted by means of a pin at the upper end of the clip body (15) and adapted to be rotated in a reverse direction by means of a spring (12).

Furthermore, a notched portion (18) may be provided in such a portion of the tongue (14) of the liner (10) which extends upwardly and thereby there are provided two tongues (19) and (20) on the opposite sides of said notched portion (18), as shown in FIG. 3 (*b*). The operation of the liner (10) which comprises tongues (19) and (20) provided on the opposite sides of a notched portion (18) will be described hereinafter with reference to FIGS. 4 and 5.

Firstly, the clip body (15) fixedly mounted on a run of chain for use in the known type tenter type stretcher advances, being driven by means of a chain wheel (22) adapted to rotate, together with the hollow shaft (26) with a key interposed there-between. The moment when the tip of the clip lever (16) is brought into contact with the guide plate (23) at the exit of the stretcher, The lever (16) is then pushed and rotated, as shown in FIG. 4, against the urging force of the spring (12) shown in FIG. 2 with the result that the tip face (17) of clip lever (16) is disengaged from the surface of the film. This releases the film from the lever (16).

The moment when said clipping lever is rotated, the air under pressure will be ejected from a nozzle (25) against the notched portion (18), thereby preventing the torn edge of the film, if it is so happens, from running off the normal path and then into the hollow behind the clip lever (16), thus insuring for the torn-off edge the positive transfer to the subsequent process such as for taking up the film.

A plurality of ejection nozzles of this kind are provided being screw-mounted around the upper rotating wall (24) of said chain wheel (22), said wall being communication, through a central hole (29) and opening (27) both formed midway of the hollow shaft (26), with the external air feed pipe. The ejection nozzles are located in such a manner that it keeps in horizontal alignment with and facing the notched portion of said liner.

It should be recognized that such an ejection mechanism may not be limited to that thus for described.

The above description has been given with reference to the liner having a notched portion in the tongue and to the operation of the nozzle from which the air under pressure is ejected against said notched portion. In case of a liner having no notched portion in the tongue thereof, the gap formed between the liner tongue and the tip face of the clip lever prevents the torn-off edge of the film from running off the normal path and hence into the hollow located behind the clip lever.

As is apparent from the foregoing, the use of the liner having the tongue of the present invention will prevent the torn-off edge of the film from running into the hollow behind the clip lever.

In addition the use of the liner having a notched portion therein will positively keep such a torn-off edge from running off the normal path by means of the air being ejected from the nozzle.

We claim:

1. A device for use in a tenter type stretcher for preventing the torn-off edge of a film or a sheet from running off the normal path, comprising a conveyor chain, a clip body mounted on said chain, a liner fixedly mounted on said clip body and consisting of a flat portion, having a length and width sufficient for clipping a film or a sheet thereon and a notched tongue extending in an inclined manner from said flat portion, a clip lever pivotted to said clip body, a spring means urging said clip lever into resilient cooperation with said liner to clip said film or sheet thereto and an ejection nozzle provided in alignment with the notch of the tongue and adapted to eject air under pressure directly against the notched portion of said tongue when said clip lever is moved to disengage said film or sheet.

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