

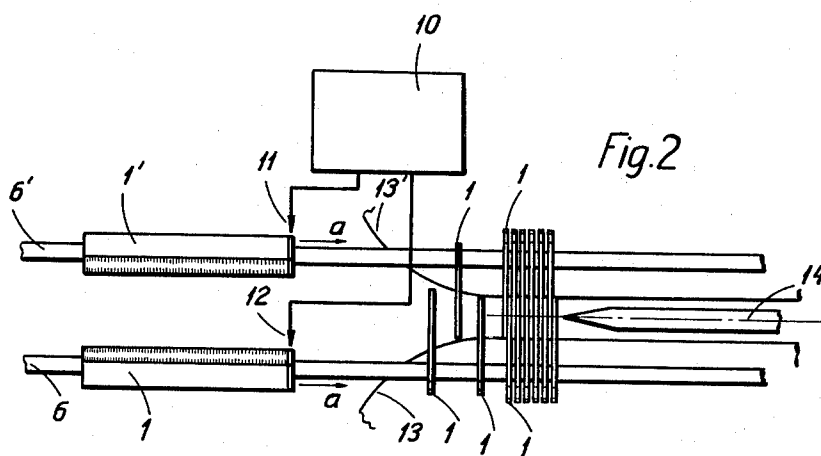
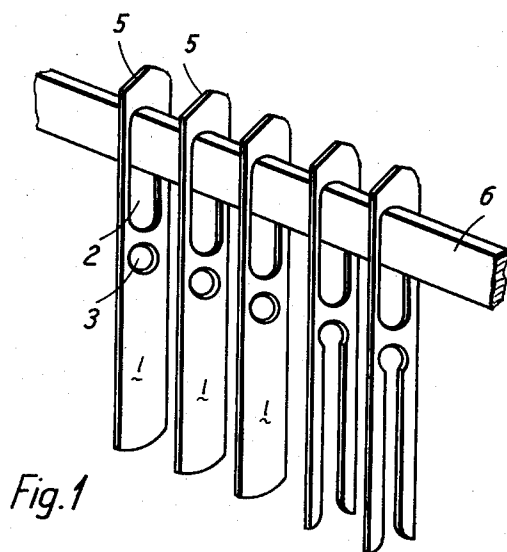
Sept. 21, 1965

F. NIEDERHAEUSER
APPARATUS FOR ALTERNATELY ARRANGING WARP FAILURE
DETECTORS IN A PACKAGE

3,206,825

Filed Jan. 23, 1963

2 Sheets-Sheet 1



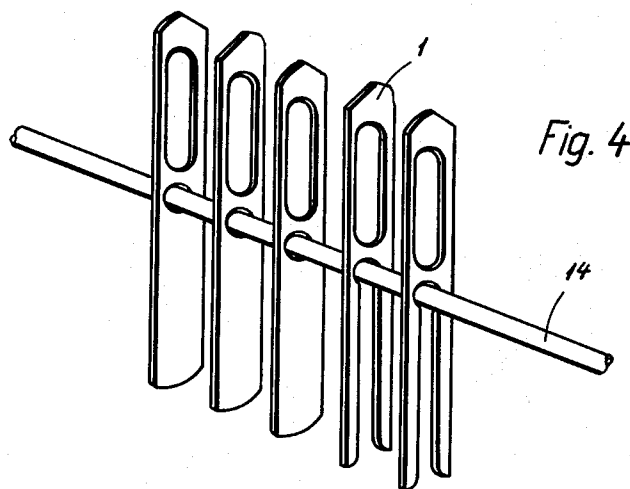
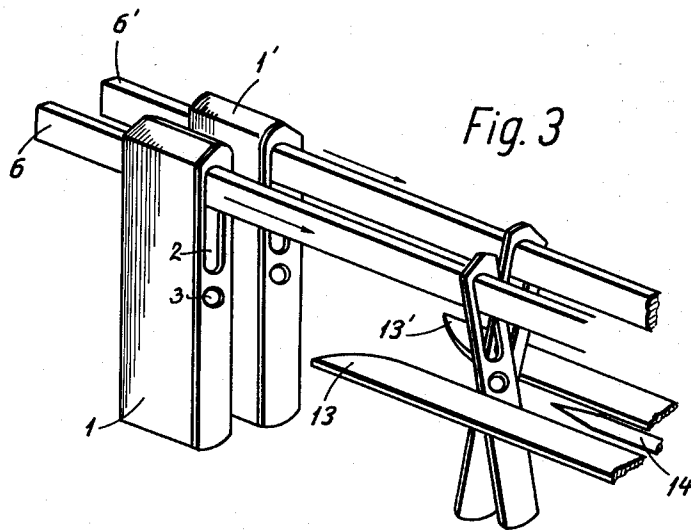
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3 Claims. (Cl. 28—46)

The invention relates to a method and means for alternately arranging warp failure detectors in a row to form a package from which the individual detectors can be consecutively separated by a machine for threading or mounting the detectors on the warp threads of a weaving machine.

The detectors usually are in the form of laminae whose outlines are asymmetric to afford separation of the detectors from the package. The detectors or laminae are arranged alternately with respect to their asymmetric contours so that consecutive separation of the outermost and only the outermost detectors from the package is facilitated.

New laminae are either arranged in packages wherein the laminae are not alternately placed or they are loose and do not form packages. It is not difficult to place the laminae of equal outlines to form packages. Transformation of such packages into packages wherein asymmetric laminae are alternately arranged, by hand takes a long time.

It is an object of the invention to provide a method of and means for arranging warp thread failure detectors or laminae having asymmetric contours alternately in a row. According to the invention laminae of equal outline are placed in like position on a first carrier bar to form a row thereon and laminae of equal outline are placed on a second carrier bar which is substantially parallel to the first carrier bar, in mirror-inverted relation to the laminae on the first carrier bar whereupon the outermost laminae of the rows of laminae on said bars are alternately and consecutively separated from the other laminae of the respective row and are swung toward each other for alining threading holes in the laminae and forming a package of laminae wherein the laminae of one row alternate with the laminae of the second row.

The apparatus according to the invention includes two substantially parallel horizontal carrier bars, each bar supporting a row of detectors, the detectors on one bar being in mirror-inverted position relative to the detectors on the second bar, a conventional mechanism for alternately and consecutively separating the outermost detectors of said rows, and guide means for swinging the detectors hanging on the first bar and on the second bar toward each other for alining threading holes in the detectors and forming a package of detectors wherein the detectors of one row alternate with the detectors of the second row and the threading holes of all detectors are alined.

The novel features which are considered characteristic of the invention are set forth with particularity in the appended claims. The invention itself, however, and additional objects and advantages thereof will best be understood from the following description of an embodiment thereof when read in connection with the accompanying drawing wherein:

FIG. 1 is a diagrammatic perspective illustration of a carrier bar supporting a plurality of warp failure detectors.

FIG. 2 is a diagrammatic top view of an arrangement according to the invention.

FIG. 3 is a diagrammatic perspective illustration of the arrangement shown in FIG. 2.

FIG. 4 is a perspective illustration of a carrier pin supporting a plurality of warp failure detectors in alternately mirror-inverted relation.

Referring more particularly to FIG. 1 of the drawing, numeral 1 designates warp failure detectors as used for checking the warp threads in a weaving machine. The size and configuration of the detectors and necessary apertures such as are designated by numerals 2 and 3 depend on the conditions under which the detectors operate.

Conventional machines are available for threading the warp threads into the detectors, or for mounting the detectors on the warp threads. The detectors are fed to the machine from packages. In order to facilitate separation of the outermost detectors from the package it is of advantage that detectors of at least two different contours are alternately arranged in mirror-inverted relation in the package. The detectors or laminae preferably have an asymmetric outline whose configuration depends on the type of apparatus which is used for separating the detectors from the package and must also be such as to reduce the cost of manufacturing the detectors.

The aforementioned asymmetry may be obtained, for example, by a one-sided grinding off of a part of a plurality of detectors which are held in a package for this purpose. As can be seen in FIG. 1 the initially round top of the detectors 1 is ground off at one side to produce an inclined surface 5.

It is desired that the detectors be presented to the threading or mounting apparatus from packages wherein the detectors are placed in alternately mirror-inverted position. To produce such packages the detectors are filed in rows on carrier bars 6, 6' whereby, for example, the detectors 1 are arranged on the carrier bar 6 with the bevelled top surfaces 5 declining to the left in FIG. 1 and all detectors 1' are arranged on the carrier bar 6' with the bevelled top surfaces 5' declining to the right as shown in FIGS. 2 and 3. The carrier bars 6, 6' are placed in parallel or almost parallel relation and guide the detectors arranged thereon to a dividing apparatus 10, for example, as disclosed in Patent No. 2,512,165. This dividing apparatus includes grippers 11 and 12 which alternately engage the detectors arranged on the bars 6' and 6, respectively, in consecutive order and move the seized detectors in the direction indicated by the arrow a.

While the detectors 1 and 1' are still hanging on the carrier bars 6 and 6' they come into engagement with guide members 13 and 13'. These guide members are approximately at the elevation of the thread eyes 3 and are so curved as to swing the detectors toward each other to aline their eyes 3. Upon further movement of the detectors to the right in FIGS. 2 and 3 a carrier rod 14 is received in the eyes 3 and 3' of the detectors 1 and 1'. The latter are now positioned like scissors. When all detectors 1 and 1' are arranged in the proper sequence on the rod 14 the carrier bars 6, 6' may be removed. In the package of detectors formed on the rod 14 and shown in FIG. 4 the detectors are alternately placed with respect to their asymmetry, as it is desired for use of the detector package in an automatic threading and detector mounting machine.

I claim:

1. An apparatus for alining warp failure detectors, having an asymmetrical configuration, in alternately mirror-inverted relation, each detector having an upper and a lower aperture, comprising:
 - a first horizontal carrier bar,
 - a second horizontal carrier bar substantially parallel to said first carrier bar,
 - said first carrier bar extending through the upper apertures of a group of detectors placed in equal relative position and hanging on the first carrier bar,
 - said second carrier bar extending through the upper

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apertures of a second group of detectors placed in equal relative position and hanging on the second carrier bar in mirror-inverted relation to the detectors of the first group,
 means for alternately consecutively separating the outermost detectors of the first group and the outermost detectors of the second group and for moving the separated detectors of the first group on the horizontal first bar and for moving the separated detectors of the second group on the horizontal second bar, and
 guide means engageable with the separated detectors depending from said carrier bars for swinging the separated detectors moving on the first bar in opposite direction to the separated detectors moving on the second bar and interspersing the detectors moving on the first bar between the detectors moving on the second bar for aligning said lower apertures.

2. An apparatus as defined in claim 1 wherein said guide means engageable with the separated detectors is formed by two spaced parallel guide rails having diverging

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ends facing the separated detectors and receiving the moving detectors between said ends and causing the detectors of one group to swing towards the detectors of the second group while moving between said ends into the space between said guide rails.

3. An apparatus as defined in claim 1 including a horizontal guide rod received in the aligned lower apertures.

References Cited by the Examiner

UNITED STATES PATENTS

1,188,070	6/16	Hathaway et al.	28—46
2,512,165	6/50	Meier	28—46
2,746,119	5/56	Meierhofer	28—46
2,812,078	11/57	Dayvault	28—46
2,843,279	7/58	Covington	214—152
2,899,736	8/59	Fleischer	28—46
3,067,889	12/62	Okonek	214—152

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