

Jan. 3, 1956

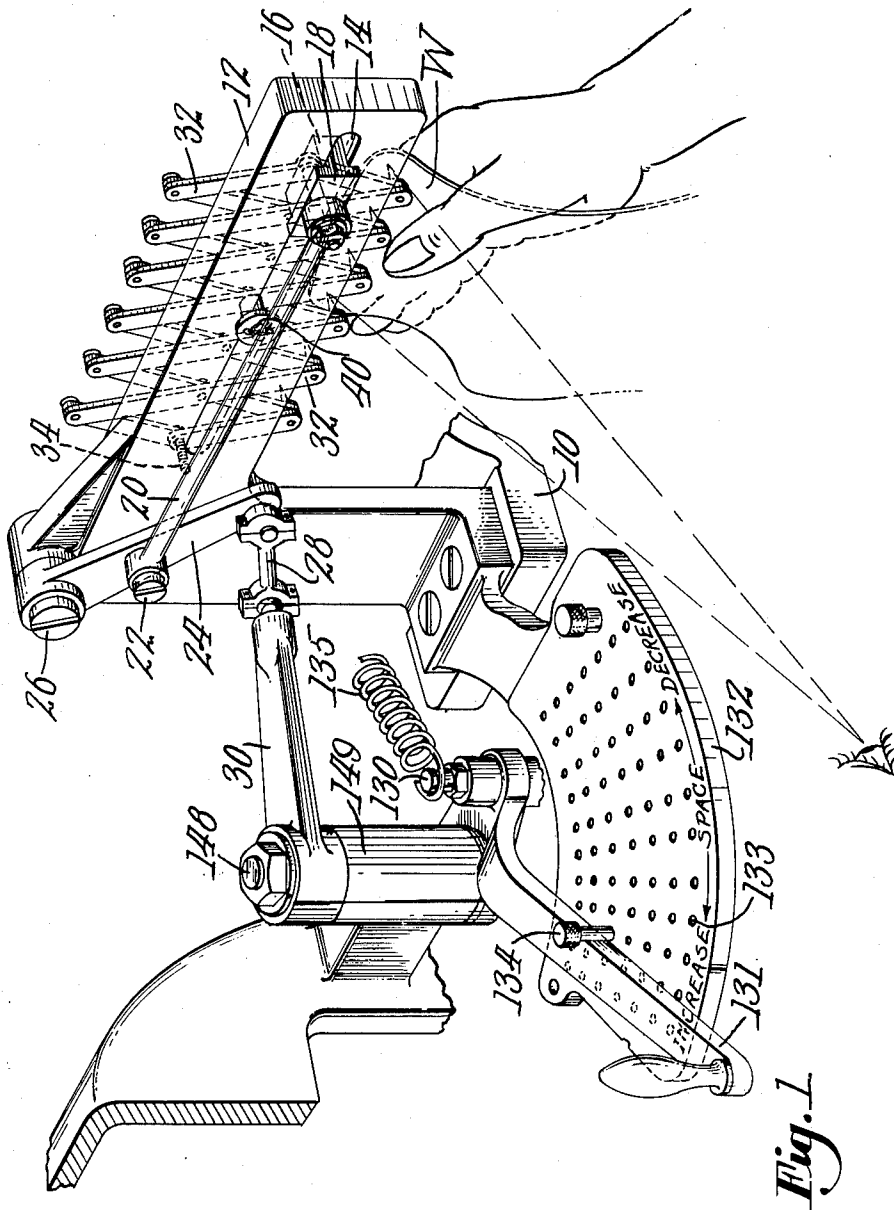
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VISUAL GAGES FOR EYELETING MACHINE SPACING ADJUSTMENT

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2 Sheets-Sheet 1



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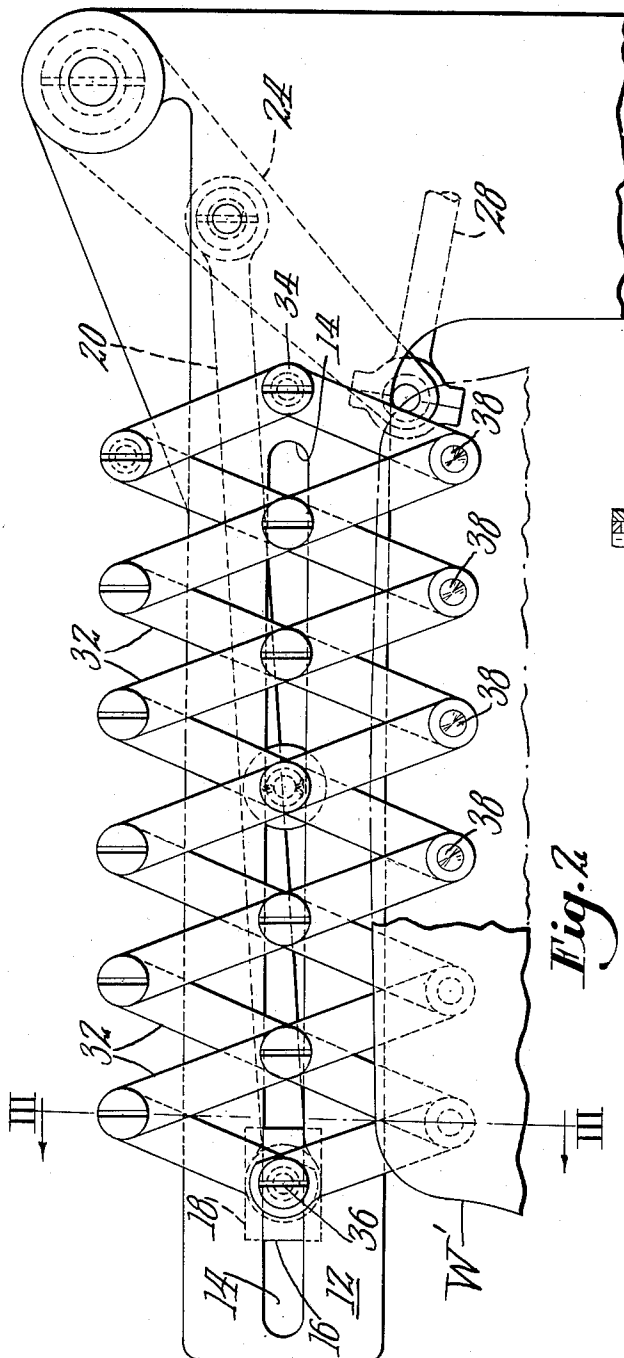
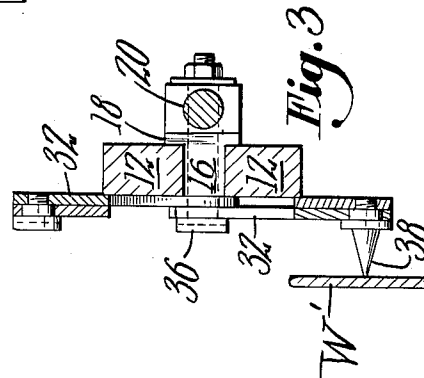
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VISUAL GAGES FOR EYELETING MACHINE SPACING ADJUSTMENT

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6 Claims. (Cl. 218-17.2)

This invention relates to eyeleting machines adapted to feed a work piece, intermittently step by step, past the eyelet inserting location, so that after insertion the eyelets are spaced apart from each other by a distance corresponding to the amount of work movement between consecutive eyelet inserting operations. More particularly it relates to a visual gage attachment to permit the machine operator, when setting the work feed adjustment for determining the desired spacing between adjacent eyelets, to visualize at a glance the propriety of the type of eyelet grouping that will be produced by the automatic operation of the machine when set for that particular work feed adjustment.

Automatic high speed eyeleting machines, provided with means for adjusting the spacing between the inserted eyelets, are extensively used in shoe factories for locating the lacing eyelets in single rows along the lacing slit of shoe uppers. One such machine is illustrated and described in my United States Patent No. 2,300,499, granted November 3, 1942. The machine therein disclosed is constructed and arranged to cyclically feed successive portions of the upper material to a fixed work station where power operated mechanisms punch eyelet receiving holes in the work one at a time, then insert and clench eyelets one at a time. The work, such as a shoe quarter, is intermittently fed, step by step toward and past the work station, by a power actuated finger that enters a clenched eyelet at the eyelet inserting locality and moves laterally therefrom causing the work to be repositioned preparatory to the next punching and eyelet inserting operation of the machine. After the feed stroke of the finger is completed the finger returns to a position beneath the next-to-be-inserted eyelet so that it may later impale said eyelet and once more feed the work to thereby provide the desired spaced grouping of the eyelets. The feed finger is actuated in the above-described manner by a cam driven linkage of lever arms in which linkage the location of a normally fixed pivot pin may be shifted to numerous positions thereby altering the effective throw of said linkage, thus to regulate the extent of movement imparted to the feed finger. The shifting of this pivot pin location is controlled by a manually adjustable lever arm which, when set, may be locked at any desired setting.

While the construction and arrangement above described permits the automatic spacing of the eyelets to be adjusted, the operator can determine only by trial and error where the last of a series of eyelets will be located in the finished work piece. In many eyeleting applications, and particularly in the insertion of shoe lace eyelets, it is of extreme importance to have the two endmost eyelets of the series properly located. Under such circumstances the distance between adjacent eyelets of the series is secondary in importance to the distance between and the location of the endmost eyelets. This factor becomes readily apparent upon considering the effect that would be produced in a shoe if the end eyelets were not schematically oriented with respect to the center of curvature at

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the top of a shoe upper or below, where the quarter meets the vamp of the shoe. While less readily appreciated, the misplacement of eyelets in an upper presents still more serious consequences to be encountered in the various steps of shoemaking, commencing with the pulling-over operation. In good shoemaking, the importance of properly locating the eyelets will be better perceived by considering the fact that shoe uppers, before being assembled on a last, are laced with twine to hold the foot opening and adjacent parts of the upper in the desired finished relationship. When the upper materials are subsequently shaped or pulled over a last, the laced eyelets prevent the upper from being pulled beyond the desired extent. It is for this reason that expert shoe designers give much thought to determining the proper number and the location of the eyelets which are to be inserted in a particular type of shoe; also, in order to assist the machine operator in properly locating the eyelets, the specified points for their insertion are sometimes indicated by prick marks formed in the upper material during the die-cutting operation. In such instances, the operator being informed as to where the eyelets should be inserted, has no difficulty in properly locating the first eyelet. However, even after years of experience an operator may miscalculate the eyelet spacing adjustment so that, by accumulated errors, the last eyelet of the series may be critically misplaced. Therefore, as above mentioned, it is common practice among eyelet inserting operators to determine the final setting of the space adjusting lever by the trial-and-error procedure which, besides being time-consuming, is costly because of the number of shoe uppers that are thereby ruined and must be discarded.

The object of the present invention is to provide mechanism which, when connected with the feed spacing adjustment controls, will enable an operator to know at a glance exactly where each eyelet in the specified series of eyelets will be located by the automatic operation of the machine. Having this knowledge the operator may quickly complete the manual spacing adjustment and lock the spacing controls at the chosen setting with infallible confidence that, when the work piece is presented to the automatic operation of the machine, each eyelet will be inserted in its intended location.

Accordingly, one of the features of this invention is the provision of a space adjustment gage having a series of indicator pointers each pantographically linked to the rest in the series and disposed at equidistant intervals and in a straight line with each other so that, upon actuation of the pantograph linkage, the pointers will move synchronously in one direction or the other to lessen or increase the distance by which each pointer is equally spaced apart from its next adjacent pointers.

Another feature of the invention is the construction and arrangement of the means for actuating the pantograph linkage whereby the resultant relative movement of the pointers on the gage is accompanied by a similar change in the feeding stroke of the eyelet spacing finger. That is to say, there is a direct and equal ratio between the distance of the feed stroke and the distance between any two adjacent pointers. This feature assures that the accumulated or combined distance of feed during a given number of machine cycles will be equal to the over-all distance between the same number of indicating pointers on the gage. Thus, if the gage pointers are located one inch apart from one another the work feed will be one inch between successive eyeleting operations. Therefore, the operator knows that if six eyelets are required to be placed in the work the distance between the endmost eyelets will be the same as the over-all distance between six gage pointers.

Still another feature of the invention is the disposition

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of the gage attachment on the machine, which is so arranged that the pointers protrude beyond any adjacent machine parts and are located in a position which readily enables the operator, when about to adjust the spacing controls for a given work piece, to hold the work itself against the gage pointers which then clearly indicate the spacing for which the machine is presently set.

The above and other objects and features of this invention will appear from the following detailed description of the preferred embodiment thereof illustrated in the accompanying drawings, and will be pointed out in the claims.

In the drawings,

Fig. 1 is a perspective view of an eyelet spacing gage constructed in accordance with the present invention and operatively connected to the adjustable feed regulating lever of an eyeleting machine;

Fig. 2 is a rear elevation showing details of the gage mechanism of Fig. 1; and

Fig. 3 is a cross sectional view, of the gage mechanism, taken along the line III—III of Fig. 2, and viewed in the direction of the arrows.

For the purpose of describing the operation and utility of the present invention, the visual gage mechanism has been illustrated, in Fig. 1, as applied to an eyeleting machine similar in construction to the machine disclosed in my United States Patent No. 2,300,499, wherein Fig. 4 shows a manually operable lever having a regulating arm 131 which may be shifted to numerous settings to thereby vary the amount of reciprocal movement imparted to the carrier 100 which, in turn, moves the feed finger 95. Inasmuch as the construction and operation of the manually regulated feed finger operating mechanism is fully illustrated and described in said patent, only so much of the feed regulating and operating mechanism has been illustrated herein as is necessary for a clear understanding of the manner in which the visual gage mechanism is operated in conjunction with the regulating arm 131; it being understood that the work feed operating mechanism does not form a part of the present invention and may be constructed the same as disclosed in the above-mentioned patent.

Referring to the drawings, and particularly to Fig. 1, it will be seen that the same reference numerals have been applied, to similar parts of the feed adjusting mechanism, as were applied to said parts as illustrated in Fig. 4 and elsewhere in my prior patent. That is to say, the regulating arm 131 is pivotally attached to a portion of the machine frame by a pin 148 rotatably mounted in a stationary bearing 149; and the movable pivot pin 130 is affixed to an offset portion of the arm 131, so that, as the arm is shifted to one side or the other, the location of the pivot 130 is changed to increase or decrease the length of the feeding strokes imparted to the work feeding finger (not shown). The free end of the arm 131 is biased toward the right (as illustrated in Fig. 1) by a spring 135, but the arm may be set in any desired location with respect to the stationary plate 132 and maintained at that setting by means of the removable stop pin 134 which may be plugged into any one of the numerous holes 133 which, at the particular setting, may be disposed adjacent the right-hand edge of the arm 131. With the stop pin thus inserted, the force of the spring 135 will maintain the adjustment arm in fixed contacting position against the pin 134. Manual shifting of the arm 131 further to the left will increase the extent of the work feeding stroke and hence cause successive eyelets to be inserted with wider spacings therebetween; and the shifting of the adjustment arm toward the right will cause the eyelets to be grouped more closely together.

The visual gage mechanism may be attached to any convenient portion of the machine frame 10, that permits the gage indicators to be conspicuously located in relation to the normal vision of the machine operator. The gage consists of a stationary bracket member 12,

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secured to the frame, and having a horizontally extending guide slot 14 formed therein. A slide block 16, having a T-head portion 18, disposed adjacent the forward face of the bracket 12, is slidably mounted within the guide slot 14. An actuating rod 20, secured at one end to the slide block, has its other end pivotally attached by a pin 22 to an intermediate portion of a lever arm 24. The arm 24 is pivotally mounted at its upper end on a pin 26 secured to the bracket 12. The lower extremity of the lever arm 24 is movably connected, by a universal joint connector 28, to a drive lever 30 extending laterally from the rotatable pin 148. The drive lever 30 is suitably splined or pinned to the pin 148 so that rotation of the pin in response to pivotal movement of the regulating arm 131, will impart a similar pivotal movement to the drive lever 30 which, in turn, will shift the lever arm 24 to move the rod 20 and slide block 16 longitudinally along the path of the guide slot 14.

The gage indicating assembly is actuated directly by the above-described movement of the slide block 16. This indicating assembly, best illustrated in Figs. 2 and 3, is in part comprised of a plurality of pantograph links 32 pivotally joined together in lazy-tong fashion. The assembly, disposed adjacent the rear face of the bracket member 12, is attached at one end to the bracket by a fixed screw 34 threaded into the member 12. The opposite end of the assembly is attached by a bolt 36 passing through the guide slot 14 and carried by the movable rod 20 and slide block 16. The lower end of each set of pantograph links carries an indicator point 38 protruding rearwardly beyond the rest of the assembly. Each point 38 remains at all times in a straight-line relation with each other point in the indicator series, and each is equidistantly spaced apart from its next adjacent point. However, the distance between the indicator points may be changed by movement of the actuating rod 20. Thus, referring once more to Fig. 1, when the work feed regulating arm 131 is moved toward the left to thereby increase the spacing between eyelets to be inserted, said movement simultaneously increases the distance between the series of indicator points 38; and movement of the arm 131 in the opposite direction to decrease the spacing between successive eyelets will likewise decrease the spacing between the series of indicator points. In addition, since the ratio of change that is effected, by any given movement of the regulator arm 131, in the work feeding stroke is at all times equal to the accompanying change in the distance between the adjacent points 38, the resultant spacing apart of the indicator points will accurately indicate the spacing apart of those eyelets which would be produced by the machine if operated with that particular work feed setting. Therefore, a machine operator, by holding a work piece W up against the points 38 (as illustrated in Fig. 1), may see at a glance the exact eyelet grouping that the feed adjustment is set to produce. In regard to the work piece W of Fig. 1, it has been assumed that the work specifications require but four eyelets to be inserted between the curved upper edges of piece W which represents an upper vamp for low quarter shoes. If the specifications should require a different number of eyelets for the piece W, the proper adjustment could be made quickly by shifting the regulator arm 131 to one side or the other until the over-all distance between the required number of points 38 is equal to and coincides with the over-all distance and location on the work piece of the first and fourth, from the right, points as they are located in Fig. 1. Fig. 2 represents the gage in use for determining the proper work feed setting for inserting six eyelets in an upper vamp W' of a high quarter shoe.

It is to be understood that the gage mechanism need in no way be limited to the six pantograph links and six indicator points as herein illustrated, because the suit-

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able number of indicators that may be required for a machine will depend upon the type of work intended to be performed. Likewise, the extent of the slot 14, defining the overall limits of the gage adjustment, may be suitably varied without departing from the scope of the present invention. If desirable, to prevent sagging or misalignment of the gage assembly, one or more supports, such as the slide pin 40 (Fig. 1), may be mounted through the guide slot 14.

While the foregoing description has been directed to the illustrated embodiment of the invention as represented by a shoe eyelet inserting machine of a particular type, it is to be understood that the invention is of much broader scope and that the hereinafter appended claims are intended to cover gage mechanisms similarly constructed and operated in conjunction with any adjustable machine element for regulating the distance of the space between successive fastenings which may be inserted through a work piece in response to the automatic operation of a fastener inserting machine. The claims are, therefore, intended to cover such visual gages if utilized for inserting other fasteners, such as grommets, hooks, snap fastener components, or other fastening means which may be mechanically applied at uniformly spaced intervals along a line of automatically controlled work feed.

Having described my invention, what is claimed as new and desired to be secured by Letters Patent of the United States is:

1. In a fastener inserting machine, of the type with which a succession of spaced apart fasteners may be inserted one at a time in a work piece and wherein the spacing apart of said fasteners may be varied by the setting of a manually movable space adjustment lever, a movable visual gaging device operatively connected with said lever by driving means and having spaced apart gaging indicators carried by the device and movable synchronously with the movement of the lever.

2. The gaging device of claim 1 in which the indicators comprise a series of equidistantly spaced apart pointers each of which is synchronously carried by one of a series of interconnected pantograph links from which the respective pointers protrude with their terminal points disposed in a common straight line.

3. The device of claim 2 in which the series of links is slidably supported upon a fixed bracket and may be longitudinally extended or collapsed to increase or decrease the space between the pointers.

4. In a fastener inserting machine, of the type with

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which a succession of spaced apart fasteners may be inserted one at a time in a work piece and wherein the spacing apart of said fasteners may be varied by the setting of a manually movable space adjustment lever, a protractile pantograph assembly comprising a series of pivotally interconnected links, a series of indicator means each equidistantly disposed with respect to the others and each carried upon one of said interconnected links, and means connecting said assembly with the movable lever, said means being so constructed and arranged that any movement of the lever will vary the spacing between the indicator means at an equal ratio with the variation produced in the spacing apart of the fasteners.

5. A visual gage attachment on an automatic fastener inserting machine having manually movable control means for adjusting the operation of the machine to vary the space between the adjacent fasteners of a series of fasteners inserted in succession into a work piece, said attachment comprising a series of indicator pointers arranged in a straight line, a movable pantograph linkage carrying said pointers, and means connecting said linkage to said movable control means whereby any manual movement imparted to said control means will cause the spacing between said indicator pointers to vary at an equal ratio with the space between the adjacent fasteners.

6. In a fastener inserting machine, of the type wherein the work is fed past a fastener inserting location in step-by-step increments and wherein a manually operable adjustment member is provided to regulate the distance of each feed increment thus to regulate the distance apart at which successive fasteners are located on the work, a series of gage indicator pointers each pantographically linked to the rest in the series and movably disposed at equidistant intervals and in a straight line with each other, and gage actuating means connecting the pantograph linkage with said adjustment member, said means and pantograph linkage being so constructed and arranged that any manual operation of the adjustment member to produce a given distance between any successive fasteners will simultaneously produce the same distance between all adjacent indicator pointers.

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