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H. T. DE MAN

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EMBOSSING TOOL HAVING PLURAL TRIGGERS WITH INTERLOCK MEANS

Original Filed Dec. 7, 1962

3 Sheets-Sheet 2

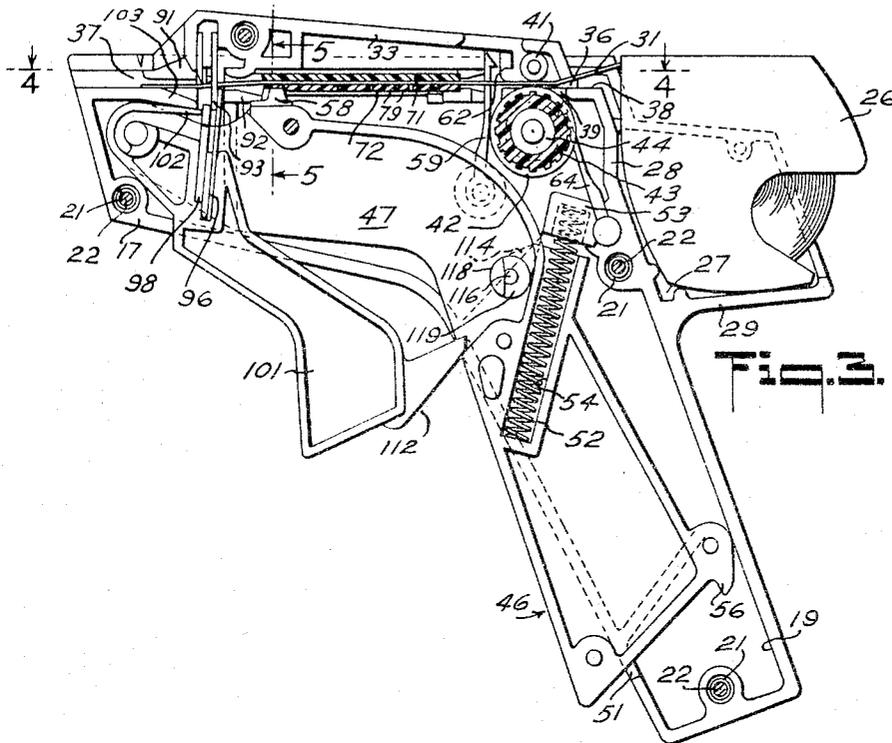


Fig. 3.

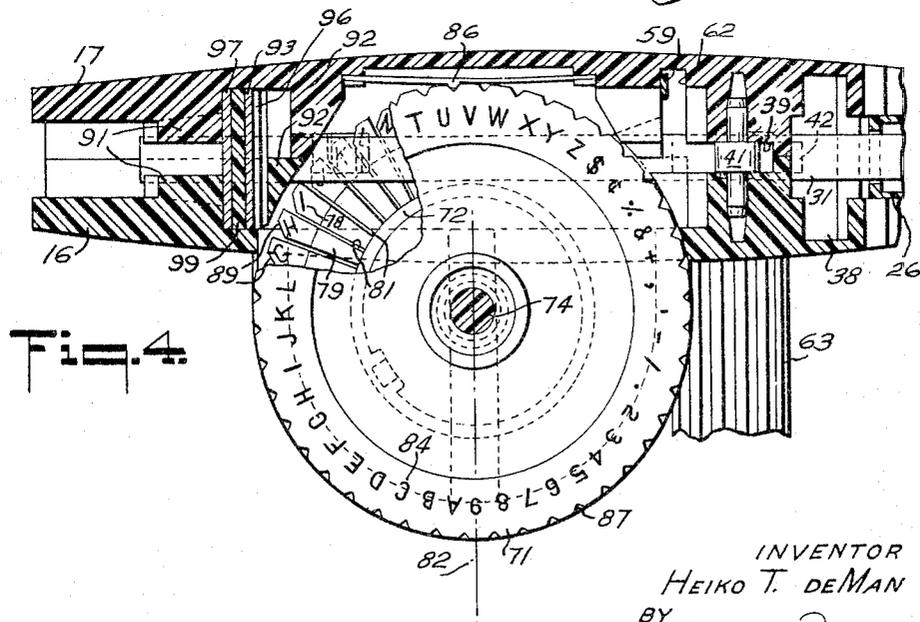


Fig. 4.

INVENTOR
HEIKO T. DE MAN
BY
Gardner & Zimmerman
ATTORNEYS

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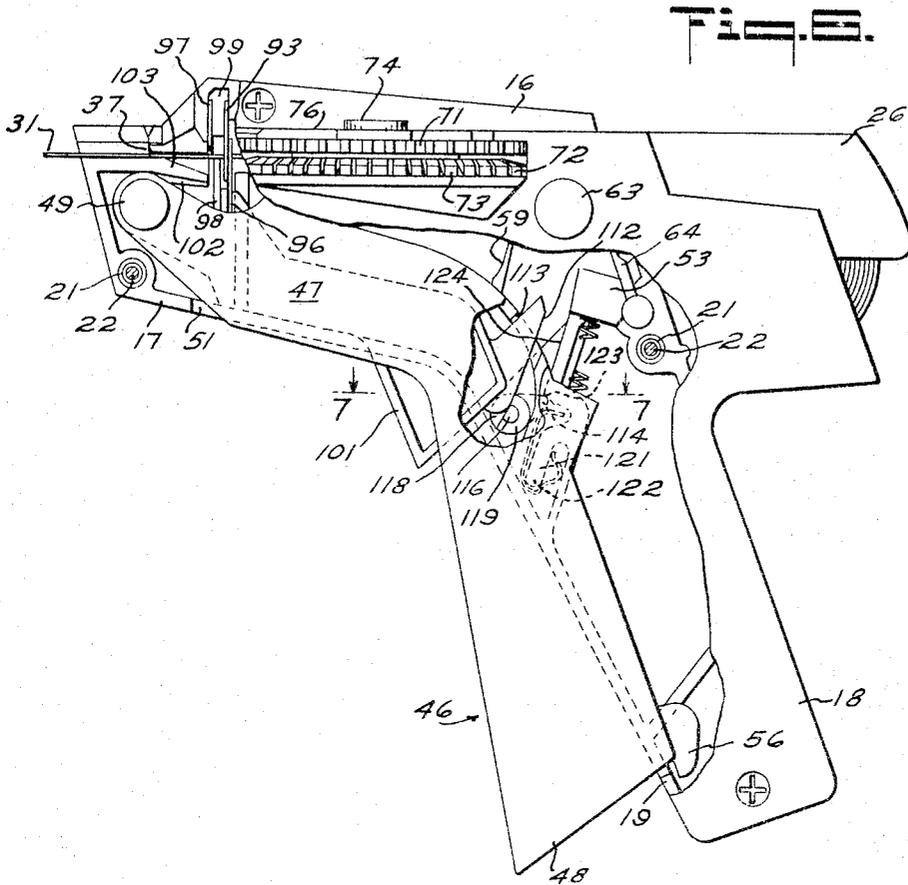


Fig. 6.

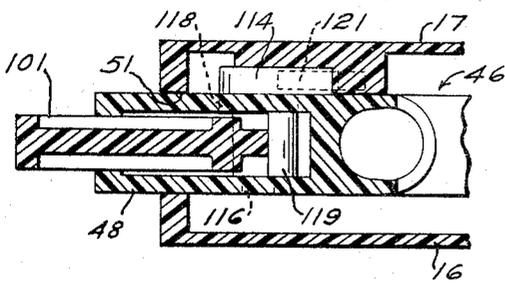


Fig. 7.

INVENTOR
HEIKO T. DE MAN
BY
Gerdes & Zimmerman
ATTORNEYS

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EMBOSSING TOOL HAVING PLURAL TRIGGERS WITH INTERLOCK MEANS

Heiko T. de Man, Moraga, Calif., assignor to Dymo Industries, Inc., Emeryville, Calif., a corporation of California

Continuation of application Ser. No. 242,964, Dec. 7, 1962. This application Aug. 18, 1965, Ser. No. 480,561
2 Claims. (Cl. 197-6.7)

This invention generally relates to embossing equipment for producing raised letters, numbers or other indicia on a strip of plastic or metal tape, and is more particularly directed towards a novel embossing die construction for use in such equipment. This application is a continuation of application Serial No. 242,964, filed December 7, 1962, now abandoned.

Numerous types of hand operated embossing machines are presently available for producing labels bearing embossed indicia from a continuous strip or tape. By way of example, reference may be made to United States Letters Patent 2,275,670, 2,415,526 and 3,006,451. These prior art devices provide for feeding the strip of material between a pair of embossing dies, and when the dies are forced into operative engagement, the strip is accordingly embossed. The embossing dies are conventionally of disk-like configuration, with the mating die indicia positioned adjacent the periphery thereof. By rotating the disks or plates, selective die characters may be positioned adjacent the tape, and upon actuation, the matching characters are forced together with the resulting embossment. While under certain circumstances, either a male or a female die may be used alone in cooperation with a resilient backing, usually both a male and a female die are provided. For example, one disk will comprise the female die member with the indicia or characters depressed below the surface thereof. The other disk will constitute the male die with matching indicia or characters raised from the surface. In order to permit movement of the selected pair of matching characters towards each other for the embossing operation, one of the disks, for example the male die, is provided with a plurality of radial notches or slots, with a single character located at the end of each segment or leaf formed thereby since the leaves are relatively flexible, actuation is readily effected by forcing the desired segment into embossing relation with the matching female die character.

It should be also understood that in accordance with devices of the above type, each indicia is aligned along a radius of its disk, e.g. the letter "T" would bisect its segment and lie along a diameter of the disk. With the tape or strip being embossed being generally tangential to the disks, the actuating plunger or other devices for effecting displacement of the segment for embossing will be positioned along a radius of the disk. With such an arrangement, it is believed clear that after the last character or indicia has been embossed on the strip, the strip must be advanced a sufficient distance to clear the embossing disks before it may be cut-off and the embossed label removed. Then, since the leading edge of the unembossed strip is now a considerable distance beyond the embossing station, and greater than the usually desired front margin, it is necessary to retract the strip before commencing the embossment of a new label.

It is accordingly an object of the present invention to provide a tool of the character described in which the embossed indicia may be readily centered on a strip of tape or the like without requiring any backing up or retraction of the tape for successive operations.

Another object of this invention is to provide an embossing machine of the character described in which the embossing operation may be carried out in close proximity

to a cut-off mechanism whereby the leading edge of the remaining tape after the cutting operation is positioned in proper position to provide a practical front margin upon commencement of the next embossing operation.

A further and important object of the invention is to provide an embossing tool in which the embossing characters or indicia are angularly related relative to their respective segments or radii so that embossing may take place on the tape at a station forward of the position whereat the diameter of the wheel is perpendicular to the tangent line of the tape.

Yet another object of the invention is to provide an embossing tool in which the tape strip is supported against lateral displacement in a novel three point manner during tape advance, embossing and cutting.

A further object of my invention is to provide a hand embossing tool which may be economically and rapidly produced and assembled, and which consists of a minimum number of parts.

Another object of my invention is to provide an improved arrangement for actuating the embossing dies and severing an embossed label from the remaining portions of the strip.

Another object of this invention is to provide a hand embossing tool in the general shape and configuration of a pistol, and in which both embossing and cutting operations are effected in the same convenient manner as in the squeezing of a trigger, and in which means are provided to prevent an embossing operation when the tape cut-off mechanism is being operated.

The invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of the preferred form of the invention which is illustrated in the drawings accompanying and forming part of the specification. It is to be understood, however, that variations in the showing made by the said drawings and description may be adopted within the scope of the invention as set forth in the claims.

Referring to said drawings:

FIGURE 1 is a top plan view of the embossing tool of the present invention.

FIGURE 2 is a side elevational view of the tool with portions of the body broken away to illustrate internal features of construction.

FIGURE 3 is a cross sectional elevational view taken substantially in the plane indicated by line 3-3 of FIGURE 1.

FIGURE 4 is a cross sectional plan view taken substantially in the plane indicated by line 4-4 of FIGURE 3.

FIGURE 5 is a transverse cross sectional view taken substantially in the plane indicated by line 5-5 of FIGURE 3.

FIGURE 6 is a view similar to FIGURE 3, but illustrating the locking of the embossing handle upon actuation of the cut-off trigger.

FIGURE 7 is a cross sectional view taken substantially in the plane indicated by line 7-7 of FIGURE 6.

The tool of the present invention is desirably formed in the general shape of a pistol, and includes two complementary body sections 16 and 17, each having a downwardly extending grip 18, 19 adjacent the rear end thereof. The sections may be secured together such as by providing tapped fittings 21 at spaced boss locations on section 17 engageable by screws 22 passing through aligned apertures formed in section 16.

Tape to be embossed is preferably provided in a magazine 26, and the latter is inserted into a cavity 27 open at the top and rear end of the body sections, but provided with a front wall 28, a bottom wall 29, and flanged side walls constituting portions of the body sections. As will

presently be described in more detail, a strip of embossable tape 31 is adapted to pass from the magazine adjacent top flanges 32, 33 of the body sections, be advanced in incremental steps by a strip feed mechanism through an embossing mechanism, and then severed by a cut-off device. The strip 31 is of course guided during its passage through the machine and is admitted to the generally hollow interior of the body in which the above apparatus is arranged through an opening 36 provided adjacent the magazine receiving cavity, and emerges through a front opening 37 formed in the body.

Immediately rearwardly of the strip opening 36 is a horizontal shelf 38 which guides the tape from a tangential outlet of the magazine to the generally rectangular opening 36, each of the sections forwardly of the opening are provided with grooved strip guides 39 which retain the strip against lateral displacement. An upper strip engaging roller 41 is journaled for free rotation in the body and overlies the strip 31, while a rubber or similar high friction feed roller 42 is provided on a hub 43 journaled on a boss 44 on section 17.

To advance the strip 31 in incremental movement towards and through the embossing dies, an embossing trigger handle 46 is operatively connected to the feed roller 42, and as will be subsequently explained, this embossing handle is likewise utilized to effect the embossing operation. Member 46 has a first portion 47 disposed generally within the body sections and a depending hand engaging portion 48 generally parallel to the body grip portions, portion 47 being pivotally secured at its front end to the front end of the body by means of hub projections 49 journaled in suitable apertures formed in the respective body sections. The handle 46 is normally maintained in the position shown in FIGURE 2 wherein the leading edge thereof extends through an opening 51 formed in the grip and body sections by means of a spring 52 engaging a boss 53 and bearing in a recess 54 formed in the handle portion 48. Further forward movement of the embossing handle is prevented by a lug 56 engaging the grip just below the opening 51.

When the handle 46 is squeezed towards the grip and moved against spring pressure to the position shown in FIGURE 3, a die actuating projection 58 is moved upwardly (as will be presently described more fully), and a resilient pawl 59 carried by the handle slides past ratchet teeth 61 formed on hub 43 into an inoperative position against a wall 62. When the handle is released, the pawl 59 will come back into engagement with teeth 61 and advance the strip one space. Provided on the hub 43 and extending outwardly from the body through an opening therein is a manually engageable wheel 63 by means of which the strip may be advanced without actuation of the embossing handle, and which likewise may be used to retract the strip when the pawl is disengaged from the ratchet teeth. A second bidirectional pawl 64 engages the teeth at all times so that when the wheel 63 is operated, a desired number of strip spaces may be audibly determined. Thus, after each embossing operation, the strip is advanced to position the same for receiving the next embossment.

The novel embossing die arrangement of the present invention will now be discussed. A pair of embossing dies 71 and 72 are journaled on a base plate 73 extending laterally outwardly from body section 16 by a pin 74 passing through the same as well as through a rib 76, extending outwardly from section 16 in superimposed parallel relation to plate 73. Each die is of disk-like configuration, and as here illustrated, the upper or female die 71 has on its lower surface a plurality of recessed characters or indicia 77 adjacent the periphery. The lower male die 72 is provided with projecting indicia 78 on its upper surface in matching relation to the female indicia, and also, as noted in FIGURE 4, each indicia 78 is provided on a flexible segment 79 formed by providing a plurality of radial slots 81 on the die disk 72.

It will be seen that the portion of the dies entering the body extends substantially past the strip 31 since the center of rotation, defined by pin 74 is located at a distance from the strip less than the radial extent of the dies. Consequently, even when the strip 31 is passed between the dies, the die indicia located on a diameter 82 normal to the strip is not in embossing relation to the strip. However, circumferentially spaced indicia are in such position both forwardly and rearwardly of such a diameter and trigger projection 58 underlies the forward of such indicia. Thus, upon trigger actuation and raising of projection 58, the segment 79 overlying the same will be forced upwardly into embossing relation with the tape strip and result in an embossment of the latter. This embossing location or station is positioned well forwardly of the die diameter 82 perpendicular or normal to the strip whereat embossing occurs in conventional apparatus. However, so that the indicia embossed on the tape will be normal or otherwise aligned with the longitudinal extent of the strip 31, each indicia 77 and 78 is oriented in parallel relation to the radius 82 and angularly related to a radial line intersecting such indicia when overlying the projection 58. Obviously where the expression "parallel relation" is used, it is meant to also include an arrangement wherein the indicia are rotated 90 degrees from that illustrated, in the event the embossed characters are to be aligned with the strip rather than normal thereto. Thus, as shown in FIGURE 4, the letter "K" overlies projection 58 with the female and male die indicia 77 and 78 adjacent opposite surfaces of the strip, and the indicia are normal to the length of the strip and parallel to radius 82. It should also be noted that the upper surface of rib 76 is provided with an indicator recess 83 and the upper surface of die 71 has the die characters reproduced as shown at 84 so that when the "K" of such reproductions is aligned with the recess 83, the actual die indicia for such a character will be in embossing relation to the strip. The disks may be rotated by the hand of the user, and a detent 86 provided in the body and in engagement with circumferentially spaced peripheral recesses 87 on disk 71 assures proper registration for each die character.

In order to provide for a maximum number of die characters on the disks, the leading edge of each segment 79 is provided with an angular cut-off portion or bevel 89, and prevents pressure or possible debossing of an embossed character on the strip upon the next succeeding embossment.

The strip guides 39 are positioned rearwardly of the embossing dies, but additional strip guides 91 and 92 are provided on each side of the strip discharge opening forwardly of the embossing die actuator or projection 58.

A strip cut-off is utilized to sever an embossed label after it has been embossed, and as here shown includes a fixed shear plate 93 extending across the path of strip movement having an opening therethrough for passage of the strip. A movable shear blade 96 also having an opening therethrough is positioned immediately rearwardly of the plate so that as the blade is raised, the tape will be severed. Also, if desired, another fixed knife 97 extends downwardly over the strip with a movable anvil 98 movable upwardly from subjacent the strip so as to effect a cutting through of the tape, but not a liner with which the tape may be provided so as to facilitate removal of the liner from the tape. The anvil is provided with a notched portion upon which the strip is seated and thereby limits the degree of knife penetration. A stripper mechanism 99 is utilized to strip the tape from the knife 97. This latter feature is not specifically claimed herein.

Actuation of the blade 96 and anvil 98 is effected by a cut-off trigger 101 carried within the embossing handle and pivoted on the same axis of movement, but movable independently thereof. The blade and anvil are carried in trigger 101, the latter being normally disposed in its

inoperative position shown in FIGURE 3 by a resilient loop or torsion member 102 extending around the pivot 49 and engageable with a fixed rib 103. Thus, when the trigger is moved against the force of member 102, the blade and anvil will be raised, and the tape strip 31 will be cut.

In operating the machine, the leading edge of the tape strip is fed from the magazine through the opening 36 and between the rollers 41 and 42. The knurled hand wheel may then be rotated in a counter clockwise direction as viewed in the drawings causing the tape to be advanced past the embossing dies and cutter and through the front opening 37, the strip being stopped at a mark 106 provided on the body adjacent such opening. The embossing wheels are rotated until the desired character 84 appears in recess 83, the actual die indicia then being in operative position on the top and bottom of the strip and overlying the actuating projection 58. The handle 46 is squeezed and the strip is embossed. The operator continues making the desired embossments and if a space is required, he may merely rotate hand wheel 63 one or more clicks, or may gently squeeze the handle to less than full embossing position which will result in advance of the strip. When the handle is released, pawl 59 will engage the ratchet teeth and effect an advance of the strip.

After the desired embossments have been made, the strip is advanced by use of the hand wheel or handle 46 until the last embossed character appears at mark 106, and the cut-off trigger is squeezed. The amount of advance is the spacing between the embossing projection and the mark, and with the machine illustrated, comprises about eight clicks or increments of movement of tape advance ratchet wheel. By positioning the cut-off mechanism medially of the mark and the projection, the label will be cut and the leading edge of the strip will be advanced past the embossing station a distance equal to the rear margin on the preceding label. Consequently a series of labels may be produced, each (with the possible exception of the first label) having equal front and rear margins on opposite sides of the embossment. No backing up or retraction of the tape is required unless for removal of the strip or for checking on a preceding embossment. To retract the tape, the handle 46 is partially squeezed to disengage pawl 59, and the wheel 63 rotated clockwise.

It will be appreciated that due to the proximity of cut-off trigger 101 and embossing handle 46, it is somewhat of a natural tendency for the user, in attempting to squeeze the trigger for cutting the tape, likewise to squeeze the embossing handle. In absence of any safety device, this would result in an accidental additional undesired embossment, or an advance of the tape during cutting causing a jamming of the tape strip or both.

Accordingly, as an important feature of the invention, there is provided a safety mechanism, actuated by movement of the cut-off trigger, to put the embossing handle in an inoperative position, so that during the cutting operation, no embossing or strip advance can occur.

As illustrated, the distal end of trigger 101 is provided with a beveled cam surface 112 normally contained within handle 46, but movable through an opening 113 formed in the handle upon squeezing of the trigger. A generally teardrop shaped cam 114 extends from one surface of handle 46 and is pivotally mounted on the latter, by means of cylindrical bearing surfaces 116 and 118, the portion 119 between the surfaces being of generally semi-cylindrical cross-sectional forms. Cam 114 normally assumes the position shown in FIGURE 3 and bears against a leaf spring 121 mounted on a downward

projection 122 formed in the body, and above such projection, the body is provided with a shoulder 123. With the parts in this position, handle 46 is readily operated with the cam 114 moving along a wall 124 extending upwardly from the shoulder. However, upon squeezing of trigger 101, the cam surface 112 thereof will engage the flat wall of cam portion 119 and force the cam to rotate against pressure of spring 121 to the position shown in FIGURE 6 wherever the end of the cam will underlie shoulder 123. Since the shoulder comprises a stationary part of the body, and the cam is secured to handle 46, it is then impossible to squeeze the handle. Upon release of the trigger and return thereof to the normal position, spring 121 will cause the cam 114 to return to its normal inoperative position shown in FIGURE 2.

What is claimed is:

1. A hand operated tape embossing tool including a body having a depending pistol grip portion, means for advancing tape through said body, embossing dies carried by said body, a strip cut-off element on said body forwardly of said dies, a handle pivotally carried by said body and squeezable towards said grip, said handle having a die-actuating element operatively connected thereto and engageable with said dies for operating the latter upon movement of said handle towards said grip and said handle further being operatively connected to said tape advancing means upon movement of the handle away from said grip, a trigger pivotally carried by said body and squeezable towards said grip and said handle and engageable with said cutoff element for actuating the latter upon movement of said trigger toward said grip, a cam pivotally carried by said handle, said body having a shoulder thereon engageable with said cam in one pivotal position of the latter for restraining movement of said handle, means normally maintaining said cam in another position permitting free movement of said handle, and said trigger having a cam-engaging portion for moving said cam into said one position upon squeezing of said trigger.

2. A hand operated embossing tool having a body, means for advancing a strip of material through said body, embossing dies carried by said body, and a strip cut-off element on said body forwardly of said dies, said body having a fixed grip portion depending therefrom, a first trigger member operatively connected to said advancing means and pivotally carried on said body and squeezable towards said grip portion, a die-actuating projection carried by said member, a second trigger pivotally carried by said body about an axis parallel to the pivotal mounting of said first trigger member and movable in general parallelism with said first trigger member and operatively connected to said cut-off element, and means locking said first trigger member in inoperative position relative to said grip portion upon squeezing of said second trigger to actuate said cut-off element.

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ROBERT E. PULFREY, *Primary Examiner*.

E. S. BURR, *Assistant Examiner*.