Oct. 1, 1940. A. MATHESON 2,216,126

MEANS FOR SUPPLYING LIQUID TO FASTENING-INSERTING MACHINES

Filed May 24, 1939 2 Sheets-Sheet 1

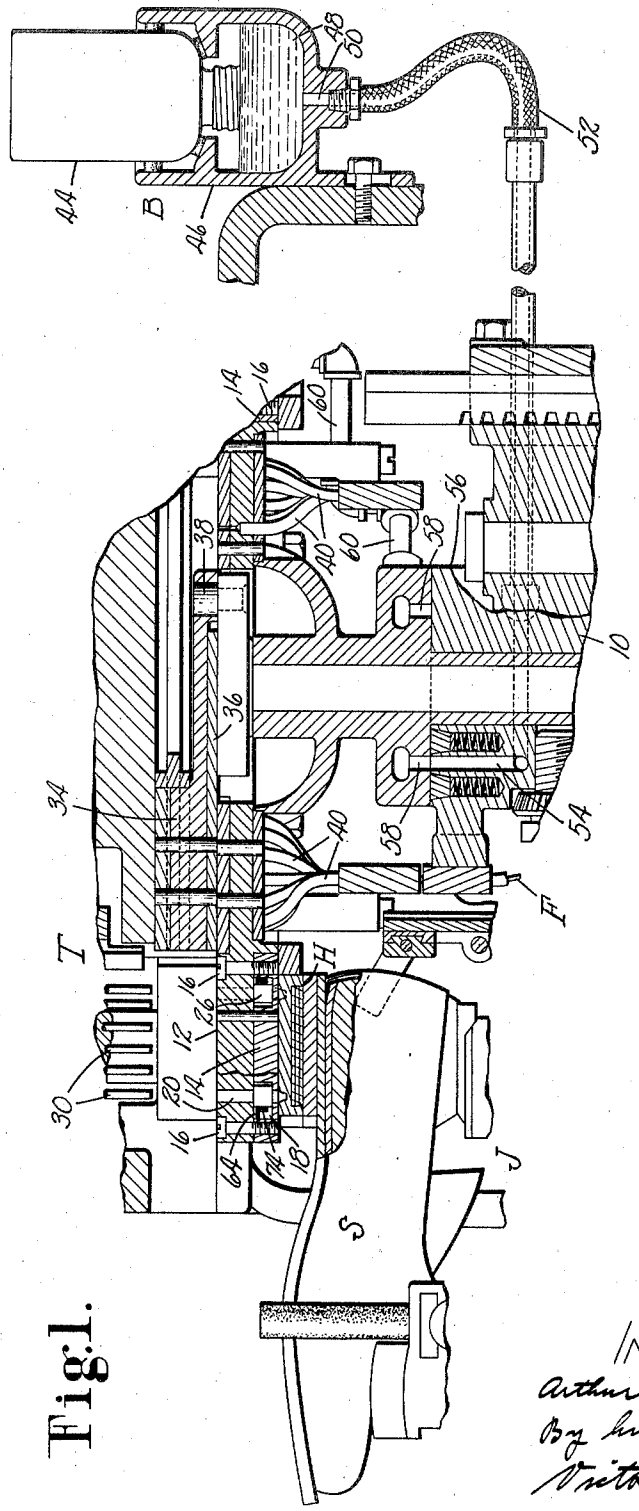


Fig.1.

INVENTOR
Arthur Matheson
By his Attorney
Victor Cobb

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Fig. 2.

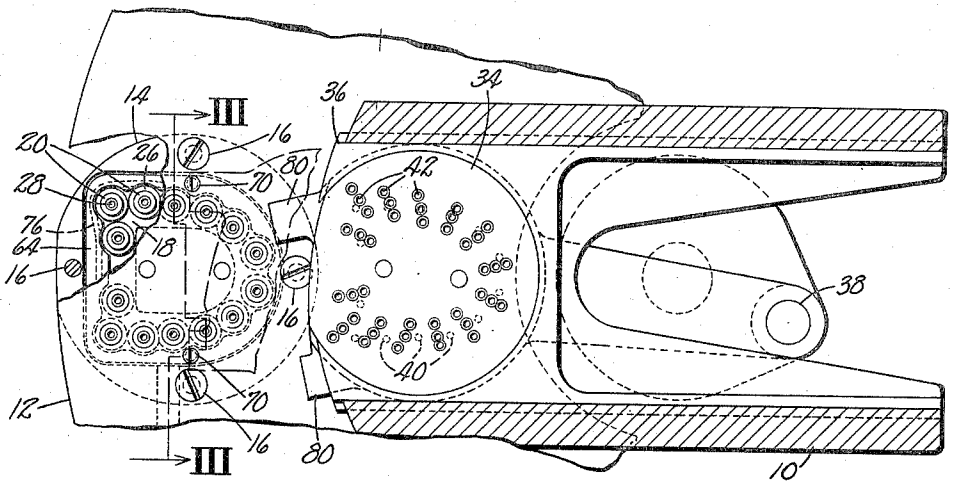


Fig. 3.

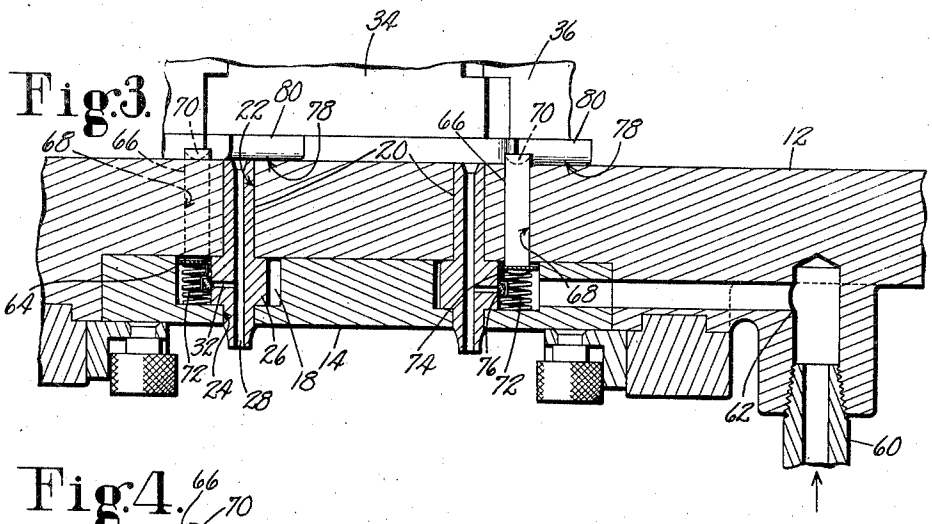
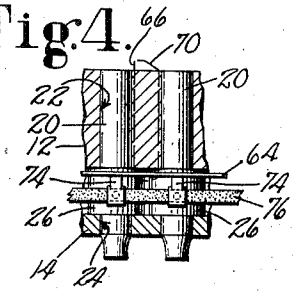


Fig. 4.



INVENTOR
Arthur Matheson
By his attorney
Victor Cobb.

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UNITED STATES PATENT OFFICE

2,216,126

MEANS FOR SUPPLYING LIQUID TO FASTENING-INSERTING MACHINES

Arthur Matheson, Brockton, Mass., assignor to United Shoe Machinery Corporation, Borough of Flemington, N. J., a corporation of New Jersey

Application May 24, 1939, Serial No. 275,433

12 Claims. (Cl. 1—32)

My invention relates to machines for inserting fastenings and in which it is desired to apply to the fastenings a liquid prior to their insertion. It is of especial utility in connection with such machines as that disclosed in the application for Letters Patent filed in the United States Patent Office on July 19, 1938, in the name of Fred N. La Chapelle and bearing the Serial Number 220,064. This apparatus is designed for the attachment of heels or heel-portions to shoes by fastenings severed from strings of adhesively coated fibrous material. When this material is moistened, a lubricating effect is obtained facilitating the insertion of the fastenings, and said fastenings may be caused to swell somewhat and the adhesiveness of their coating increased, so they are given added holding power in the work.

An object of the invention is to apply the liquid to the fastenings in a manner which will cause them to receive uniformly, only such a quantity as to give the above-indicated results, with freedom from an excess supply which would be likely to produce a drip interfering with the proper operation of the machine. In the attainment of this object, there is combined with an inserting die provided with a fastening-passage about which there is a space, means for supplying liquid to the die, and means movable in the die-space for controlling the flow of liquid to the passage. The die preferably has a plurality of tubes, in each of which is a passage with an opening through the tube into the passage, the tube-openings being surrounded by the space in the die. There is means for supplying the liquid to this space and means for causing a flow of the liquid through the openings into the passages. By the control exercised substantially at the points at which the liquid is to be used, the amount may be quite exactly determined and the delivery limited to this. As herein shown, there is a member movable in the die-space, which will apply pressure to the liquid and thus positively cause the flow through the openings. This member may also act to open and close the tube-openings and thus limit the delivery of the liquid to the proper times. It may be in the form of a plate extending about the tubes and having yieldable portions controlling the tube-openings. The space in the die may be supplied with the liquid from a barometric feed device, the head which this may cause being added to the delivery-force produced by the movement of the plate in the die-space.

In an application filed in the United States Patent Office on May 24, 1939, in the names of Raymond P. Legro and Gaynor O'Gorman and bearing the Serial No. 275,432, is described and claimed certain subject-matter disclosed herein.

In the accompanying drawings, in which appears one of the several forms which my invention may assume,

Fig. 1 shows my improved liquid-supplying means in vertical section, associated with a machine for attaching heels by fiber fastenings;

Fig. 2 is a broken top plan view of the die of the machine with its loading mechanism;

Fig. 3, an enlarged transverse section on the line III—III of Fig. 2; and

Fig. 4, a detail, in broken elevation, of two of the die-tubes and the adjacent portion of the liquid-controlling means.

The invention is illustrated in combination with a heel-attaching machine of the turret-type, similar to that of the previously mentioned application, though it is to be understood that it is equally applicable to apparatus having but a single fastening-inserting mechanism and to other forms than that of La Chapelle. The frame 10 of the heeler carries a jack J, upon which is supported the work to be operated upon, as a shoe S to which a heel H is to be secured. Rotatable upon the frame is a turret T, including a horizontal plate 12 having set in recesses about the underside of its periphery a series of dies 14, one for each plurality of inserting designs which are to be employed. For the purposes of the present invention, but one of these dies need be considered. The die 14 is held secured in the plate-recess by screws 16 and contains at its upper side a space 18 of generally horseshoe-shape. Die-tubes 20, arranged in accordance with an inserting design, pass through bores 22 in the plate and alined bores 24 in the die, and have cylindrical enlargements 26 in the space 18 with their peripheries separated from its opposite side walls. Extending axially of each tube is a passage 28 to receive a fastening and one of a set of reciprocatory drivers 30 (Fig. 1), by which the fastening may be inserted in the work. Through the side of each tube-enlargement, outwardly from the axis, is an opening 32 connecting the passage with the space 18. With the drivers elevated, fastenings are delivered to the passages 28 by loading mechanism, having a block 34 mounted to oscillate upon a slide 36 guided upon the plate 12. Both these movements of the block are produced by crank mechanism 38 rotatable upon the frame 10. Through tubes 40, the block 34, when retracted, receives in its passages 42 corresponding to the design of the

die-passages, the ends of strings F of fastening material. These strings may be twisted from paper sized with a stiffening, water-soluble adhesive. Into the loader-block, the ends of the strings are advanced through the tubes, and are severed by its compound movement to furnish discrete fastenings, which are advanced into registration with the die-passages 28. From these, the fastenings are forced by the descent of the drivers through the heel H and the heel-seat of the shoe S for the attachment of the former. Prior to this inserting stroke, the drivers are reciprocated to prick the work to facilitate the introduction of the fastenings.

It is desired that there shall be applied to the fastenings, after the pricking stroke of the drivers and before said fastenings enter the work, a liquid which may be effective for such results as activating the adhesive coating, causing the fiber to swell and rendering easier the entrance of the fastenings into the work. The last of these is especially useful in conection with the attachment of rubber heels or lifts. For this delivery, water is supplied to the die-space 18 from such a source as a barometric feed device B. This is illustrated in Fig. 1 as consisting of a bottle or like container 44 inverted upon a holder 46, furnishing within it a receptacle 48 into which the neck of the bottle extends. In this receptacle, the water from the bottle will rise to a definite height. From an opening 50 in the bottom of the receptacle, a pipe 52, for the turret machine, conveys water to a passage 54 in a stationary head 56. Passages 58 in the turret, connecting pipes 60 and passages 62 (Fig. 3), respectively individual to the dies 14, deliver the water to the die-space 18 of the inserting mechanism which is in operating position, and the passage 58 of which is in registration with the head-passage 54.

Considering the single active die which is to be supplied, the water will rise in the space 18 to a height determined by that in the receptacle 48. This may be at different levels with respect to the tube-openings 32. The chosen relation may be varied by raising or lowering the barometric device B, and by this means the force tending to cause the flow of water through the openings into the tube-passages may be altered. Movable within the die-space is means for both forcing and controlling the flow of water through the openings. This is shown as a horizontal plate 64 extending about the outside of the tube-enlargements 26 and having an area equal to a considerable portion of that of the space 18. The plate is guided for vertical reciprocation by upward projections 66, 66 extending through bores 68 in the turret-plate 12. These projections are normally held with their inclined upper ends 70 above the upper surface of the turret-plate by springs 72, 72, interposed between the underside of the plate and the bottom of the space 18 outside the tubes. Depending from the inner edge of the plate 64 are yieldable projections 74, preferably one for each of the tube-openings 32. Secured to the inner side of the lower extremity of these projections or fingers is yieldable material, for example rubber, shown in Figs. 2 and 4 as a continuous band 76.

Normally, the plate 64 is held by the springs 72 at the top of the space 18. In this position, the band 76 lies opposite the tube-openings, being forced toward them by the resilience of the fingers, so the respective portions serve as valves to close the openings 32 against the entrance of water from the space into the passages 28. After the drivers have made their first stroke to prick the work, which is clamped against the lower extremities of the tubes 20, the loader-block 34 is advanced to divide fastenings from the strings F and transfer these into alinement with the passages 28. Before this position is reached, upwardly and forwardly inclined surfaces 78 upon projections 80, from the outer extremity of the loading mechanism, strike simultaneously the inclined upper ends 70 of the plate-projections 66. The plate 64 is thereby depressed against the force of the springs 72, it moving longitudinally of the tubes. The band 76 at once leaves the openings 32, freeing these to receive water from the die-space. The plate, urged against the surface of the liquid in the space, creates a pressure thereon, which is added to any which may be caused by the head resulting from the elevated supply in the receptacle 48. The water is thereby forced positively through the openings 32 into the die-passages, the action of the plate upon the water adjacent to all the openings, tending to give uniform delivery into all the tubes. The water is retained in the passages by the work closing their lower ends. The drivers descend through the block-passages 42 and die-passages 28, forcing the severed fastenings out of the block through the die-passages into the work. In their travel through the latter passages, they take up the water therein, furnishing the lubricating and retaining action already mentioned. While the drivers are in the die-passages, they close the openings 32 to prevent the delivery of water. As soon as they rise, the block 34 is retracted, permitting the springs 72 to elevate the plate 64. The valve-band 76 thereupon closes the openings 32 until the machine is again operated.

Having described the invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a fastening-inserting machine, inserting mechanism having a die provided with a fastening-inserting passage and with a space connected to said passage, means for supplying liquid to the space in the die, and means movable in said space for controlling the flow of liquid into the passage.

2. In a fastening-inserting machine, inserting mechanism having a die provided with a fastening-inserting passage, means for supplying liquid to the die at a predetermined pressure, and means movable in the die for controlling the flow of liquid into the passage.

3. In a fastening-inserting machine, inserting mechanism having a die provided with tubes in which are fastening-receiving passages, there being a space in the die surrounding the tubes and an opening in each tube connecting its passage to the space, means for supplying liquid to the space, and means in the space for causing a flow of liquid through the openings into the passages.

4. In a fastening-inserting machine, inserting mechanism having a die provided with tubes in which are fastening-receiving passages, there being a space in the die surrounding the tubes and an opening in each tube connecting its passage to the space, and a member movable in the space to apply pressure to the liquid therein.

5. In a fastening-inserting machine, inserting mechanism having a die provided with tubes in which are fastening-receiving passages, there being a space in the die surrounding the tubes and

an opening in each tube connecting its passage to the space, and a member movable in the space for controlling the flow of liquid through the openings into the passages.

6. In a fastening-inserting machine, inserting mechanism having a die provided with tubes in which are fastening-receiving passages, there being a space in the die surrounding the tubes and an opening in each tube connecting its passage to the space, means for supplying liquid to the space at a predetermined pressure, and means in the space for causing a flow of liquid through the openings into the passages.

7. In a fastening-inserting machine, inserting mechanism having a die provided with tubes in which are fastening-receiving passages, there being a space in the die surrounding the tubes and an opening in each tube connecting its passage to the space, a barometric feed device for supplying liquid to the space, and means in the space for causing a flow of liquid through the openings into the passages.

8. In a fastening-inserting machine, inserting mechanism having a die provided with tubes in which are fastening-receiving passages, there being a space in the die surrounding the tubes and an opening in each tube connecting its passage to the space, and a member movable in the space to open and close the tube-openings.

9. In a fastening-inserting machine, inserting mechanism having a die provided with tubes in which are fastening-receiving passages, there being a space in the die surrounding the tubes and an opening in each tube connecting its passage to the space, and a plate movable in the space and longitudinally of the tubes and having means to open and close the openings.

10. In a fastening-inserting machine, inserting mechanism having a die provided with tubes in which are fastening-receiving passages, there being a space in the die surrounding the tubes and an opening in each tube connecting its passage to the space, and a member movable in the space and having yieldable portions controlling the openings.

11. In a fastening-inserting machine, inserting mechanism having a die provided with tubes in which are fastening-receiving passages, there being a space in the die surrounding the tubes and an opening in each tube connecting its passage to the space, and a plate movable in the space and extending therein about the tubes.

12. In a fastening-inserting machine, inserting mechanism having a die provided with tubes in which are fastening-receiving passages, there being a space in the die surrounding the tubes and an opening in each tube connecting its passage to the space, a plate movable in the space and having projecting fingers, and yieldable material carried by the fingers for co-operation with the tube-openings.

ARTHUR MATHESON.