June 6, 1939. C. A. ROBINSON 2,160,908

WIRE STRAIGHTENING DEVICE

Filed Jan. 25, 1938

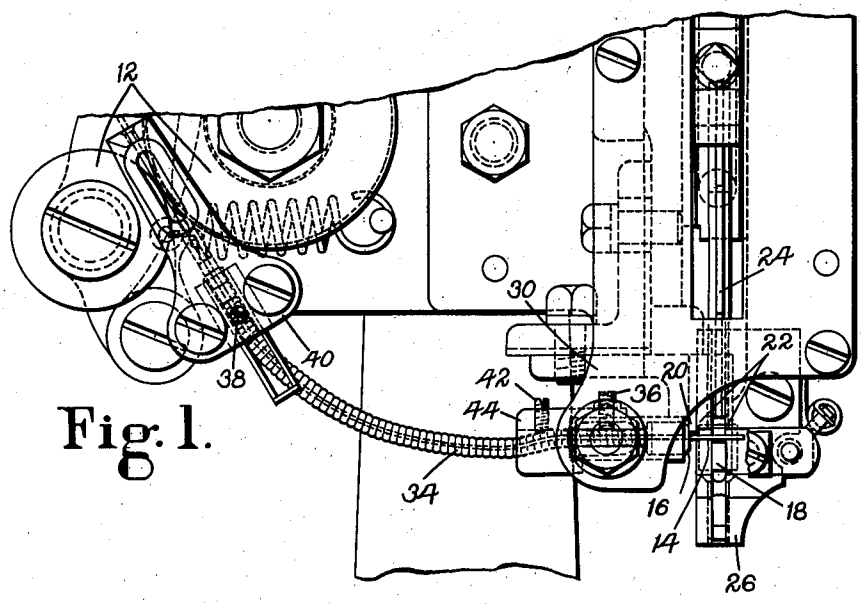

Fig. 1.

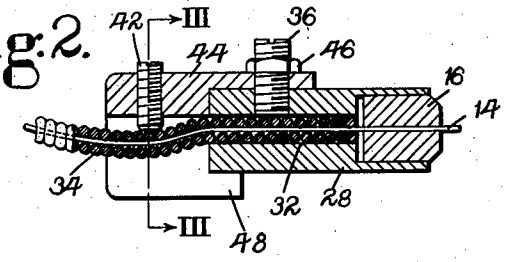

Fig. 2.

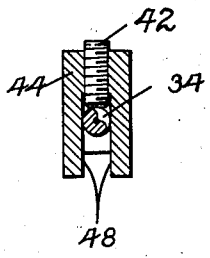

Fig. 3.

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UNITED STATES PATENT OFFICE

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WIRE STRAIGHTENING DEVICE

Charles A. Robinson, Salem, Mass., assignor to United Shoe Machinery Corporation, Paterson, N. J., a corporation of New Jersey

Application January 25, 1938, Serial No. 186,868

4 Claims. (Cl. 1—20)

This invention relates to a wire straightening device and is herein illustrated as embodied in a fastening inserting machine of the type illustrated in United States Letters Patent No. 2,079,040, granted upon an application filed May 4, 1937, in my name.

Machines of the type above referred to comprise staple forming and driving instrumentalities and mechanism for feeding wire to such instrumentalities. It is an object of the present invention to provide an improved wire straightening device of simple construction which is particularly adapted to straighten wire prior to feeding the same to the forming instrumentalities. To this end and as illustrated, the invention provides, in a machine of the type referred to, a flexible conduit for conducting wire from feeding mechanism to fastening forming mechanism, the conduit being secured in fixed position at its ends and there being means for confining movement of the conduit between its ends substatially to a single plane together with means for varying the configuration of the conduit between its ends in said plane. This construction is advantageous in that by varying the configuration of the conduit distortion of the wire due to its coiling and to bending during feed movement is compensated to the extent that the wire is straight when it is presented to the forming instrumentalities, thereby avoiding clogging of the machine or the formation of imperfect staples.

These and other features of the invention are disclosed in the following specification and in the accompanying drawing and are pointed out in the appended claims.

In the drawing,

Fig. 1 is a side view elevation of a portion of a fastening inserting machine embodying my invention;

Fig. 2 is a cross sectional view through the wire straightening device; and

Fig. 3 is a cross section on line III—III of Fig. 2.

As illustrated in Fig. 1 of the drawing, the illustrated machine is a staple fastening inserting machine comprising a frame carrying feed rolls 12 adapted to feed fine wire 14 through a nozzle 16 and over an inside former 18, a cutter 20 cooperable with the end portion of the nozzle 16 to sever a length of wire, an outside former 22 to form a staple, and a driver 24 to force the staple through a throat 26 after the inside former is retracted. The construction thus far described is illustrated and described in greater detail in the aforementioned Letters Patent No. 2,079,040.

The nozzle 16 is carried by a block 28 secured to the lower end of a bracket 30 on the frame. The block 28 is provided with a straight passage 32 in which is positioned one end of a flexible helical wire tube 34 which acts as a conduit for supporting the wire 14 as it is advanced from the feed rolls 12 to the nozzle 16. The ends of the conduit are held in fixed position by a screw 36 extending through the top of the block 28 and a screw 38 which secures the other end of the conduit in position in a bracket 40 adjacent to the feed rolls 12. It is to be noted that the wire extending through the conduit 34 is bent through approximately 60° in passing from the feed rolls 12 to the nozzle 16. This imparts a curvature to the wire in addition to that already present due to coiling and, if there were no compensating device, the wire would tend to curve when it left the nozzle 16 with the result that the machine might become clogged by improperly positioned wire at the point where the staple-forming operation takes place.

In order to compensate for the curvature thus imparted to the wire I provided a device for curving the wire in the opposite direction at points adjacent to the inner end of the block 28. This device comprises a screw 42 carried by a saddle shaped member 44 which is mounted on the block 28 and held in position thereon by the screw 36 and a nut 46. The screw 42 is positioned laterally of the inner end of the block and is adapted to engage the conduit 34 to vary its configuration, as required to remove the curvature in the wire 14.

In order to prevent lateral movement of the conduit 34 such as might impart a transverse curvature to the conduit 34 and consequently the wire 14, the saddle 44 is provided with side walls 48 which extend heightwise of the machine and embrace the conduit 34, the arrangement being such that the walls confine movement of the conduit to a single vertical plane. Thus the only curvature imparted to the wire as a result of the curvature of the conduit 34 is in a vertical plane and this can be varied by adjustment of the screw 42.

In the operation of the machine the feed rolls advance the wire 14 through the conduit and through the nozzle 16 to the fastening forming mechanism 18 and 22, the reverse curve in the conduit 34 produced by the screw 42 being effective to straighten the wire prior to its entrance to the nozzle.

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

1. A wire straightening device comprising a

flexible tube supported at its end portions, abutments for limiting movement of the tube between its end portions to movement in a single plane, and a screw engaging a portion of the tube between said abutments and adjustable to vary the configuration of the tube in said plane.

2. A wire straightening device comprising a flexible tube supported at its end portions, parallel abutments for confining movement of the tube between its end portions to movement substantially along a single plane, and means for engaging a portion of the tube between said abutments to hold the tube in a predetermined curved configuration adjacent to one of its end portions.

3. A fastening inserting machine comprising staple forming and inserting instrumentalities, a pair of feed rolls constructed and arranged to feed wire to said instrumentalities, a flexible conduit for the wire located between the feed rolls and the staple forming instrumentalities, means for limiting movement of the conduit in a transverse direction, and means engaging the conduit between said limiting means for carrying the curvature of the conduit between its ends.

4. In a fastening inserting machine comprising staple forming instrumentalities, a block having a straight passage adjacent to the forming instrumentalities, a pair of feed rolls for advancing wire to the block, a flexible conduit for the wire positioned between the feed rolls and the block, a saddle secured to the block and having parallel walls located upon opposite sides of the conduit to restrict movements of the conduit in a lateral direction, and means for varying the curvature of the conduit at a point between said walls.

CHARLES A. ROBINSON.

CERTIFICATE OF CORRECTION.

Patent No. 2,160,908. June 6, 1939.

CHARLES A. ROBINSON.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, second column, line 5, claim 3, for "carrying" read varying; line 13-14, claim 4, for "paralled" read parallel; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 19th day of March, A. D. 1940.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)