July 27, 1937. M. VOGEL 2,088,005

METHOD OF FORMING WIRE STAPLES

Filed Aug. 20, 1936

Fig. 1.

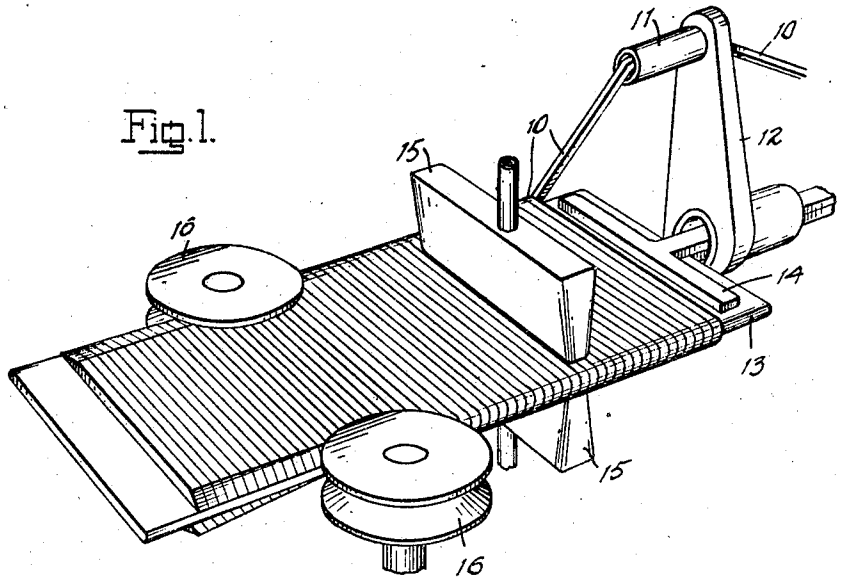


Fig. 2.

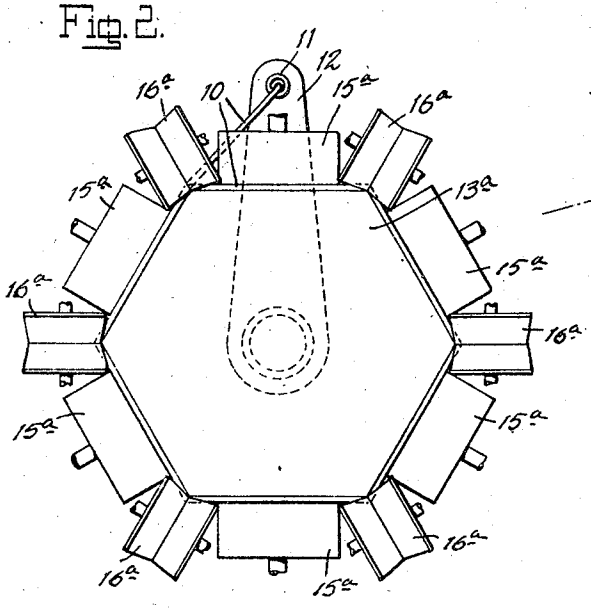
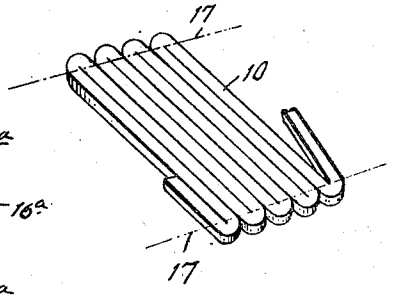


Fig. 3.



INVENTOR
MAX VOGEL.
BY
Harris Matthews.
ATTORNEY

Patented July 27, 1937 2,088,005

UNITED STATES PATENT OFFICE

2,088,005

METHOD OF FORMING WIRE STAPLES

Max Vogel, Frankfort-on-the-Main, Germany

Application August 20, 1936, Serial No. 96,956

9 Claims. (Cl. 59—77)

The present invention relates to wire staples and method of producing the same, and has for an object to provide a method by which staple strips may be formed continuously in an economical and speedy manner, it being possible according to the method to produce staple strips of any desired length from a continuous strand of wire, the staple strips thus produced being adapted for use either in flat strips or in rolls. It is particularly proposed to form staple strips by first winding, or otherwise bending a wire to form a series of staple length wire portions, then applying an adhesive to cause the staple length wire portions to adhere to each other, and then cutting the wound or bent wire contiguously to the ends of the staple length wire portions, so as to produce a continuous strip having a series of individual staple forming pieces joined together by an adhesive. The method contemplates the continuous carrying out these steps in a line along which the wire is moved through the consecutive steps of the process, the wire being continuously fed at one end of the line and the finished staple strips moving continuously off the other end of the line.

According to one manner of carrying out the method, according to the invention, the wire is wound as a helix about a mandrel, the helix first moving into relation with adhesive applying means, and next moving into relation with cutting means for producing cuts along the helix parallel to its axis of movement, whereby a plurality of staple strips are cut from the helix, each strip consisting of a continuous series of staple forming pieces connected by adhesive. According to another manner of carrying out the invention I propose to bend the wire back and forth upon itself to form a series of staple forming wire portions, next applying an adhesive thereto, and finally removing the marginal bends between the staple forming portions of wire to produce a strip of staple forming pieces joined by adhesive, these steps being carried out in continuous line.

In the accompanying drawing I have illustrated means for carrying out my improved method.

In the drawing:

Fig. 1 is a perspective view of a machine showing the step by step formation of the wire into two continuous staple strips.

Fig. 2 is a sectional view of a modified form of machine upon which the wire may be wound in such manner as to simultaneously produce six continuous staple strips.

Fig. 3 is a perspective view showing a modified manner of forming the wire into a staple strip according to the invention.

Referring to the drawing the wire 10 is fed through a tube 11 carried upon a rotatable winding arm 12 disposed in axial alignment with the mandrel plate 13, about which the wire is wound in the form of a helix by rotation of the arm 12. Thus two continuous series of parallel staple length wire portions are produced upon the mandrel. As the wire is wound a reciprocating pusher 14 or other suitable feeding means, engages the end of the helix and gradually feeds it forwardly along the mandrel, the movement of the pusher being timed with the winding arm so that the feed of the helix will synchronize with the winding in such manner that the convolutions will contact each other.

The wound wire is next engaged by adhesive applying nozzles 15 at the upper and lower sides which apply suitable adhesive such as glue, lacquer, cellulose-acetate or the like, which dries rapidly before the next step of the method is applied to the helix. Instead of applying an adhesive as illustrated it may be sprayed on or the wire may be moved through a tank of adhesive. Also it may be applied as thin metal spray, electro-plated metal, or as a thin solder coating.

The helix as it moves along the mandrel is next engaged by cutting tools 16—16 which may be suitably shaped emery wheels, or the like, adapted to both cut the helix into two strips along the bending lines and at the same time point the ends of the staple forming pieces of the strips. Two flat staple strips move continuously off the mandrel and may be rolled or periodically cut off into desired lengths. Staple strips thus formed are adapted for use in stapling machines of the type in which the staple forming pieces are individually bent into U-shape staple form in the machine and are then severed from the strip as the staple is driven into the material to be stapled. If desired, however, the strips may be bent into U-form previous to their insertion in the stapling machine.

In Fig. 2, I have illustrated a modified form of apparatus in which the mandrel 13a is hexagonal in cross-section, there being six adhesive applying means 15a for applying adhesive to the strip forming portions between the bends, and there being six cutting and pointing means 16a for separating the strips from each other along the bends. It will be understood that any desired number of strips may be continuously produced

in a similar manner by employing mandrels having the desired number of sides.

In Fig. 3, I have illustrated a modified method of carrying out the invention in which the wire 10 is bent back and forth upon itself to form a continuous strip to which adhesive is next applied in substantially the same manner as in the first described method, the staple length wire portions being next formed into individual staple forming pieces adhesively joined together in a continuous staple strip by severing the marginal bends of the strip along the lines 17—17, this last step being performed by cutting and pointing wheels similar to the wheels 16, or by other suitable cutting means.

While I have illustrated preferred methods in carrying out the invention it will be understood that the same may be varied without departing from the spirit and scope of the invention.

Having thus described my invention what I claim and desire to secure by Letters Patent is:—

1. The method of producing a staple strip continuously, which consists in bending a length of wire to produce a continuous row of integrally connected substantially staple length wire portions and adhesively connecting said portions, and cutting the wire in relation to the bends between the staple length wire portions to continuously form a staple strip consisting of a row of adhesively connected individual staple forming pieces.

2. The method of producing a staple strip continuously, which consists in bending a length of wire to produce a continuous row of integrally connected substantially staple length wire portions, then applying an adhesive to said row to adhesively connect said portions, and then cutting the wire in relation to the bends between the staple length wire portions to continuously form a staple strip consisting of a row of adhesively connected individual staple forming pieces.

3. The method of producing a staple strip continuously, which consists in bending a length of wire to produce a continuous row of integrally connected substantially staple length wire portions and adhesively connecting said portions, feeding said bent wire in a direction parallel to the direction of said row, and cutting the wire in relation to the bends between the staple length wire portions to continuously form a staple strip consisting of a row of adhesively connected individual staple forming pieces.

4. The method of producing a staple strip continuously, which consists in bending a length of wire to produce a continuous row of integrally connected substantially staple length wire portions, feeding said bent wire in a direction parallel to the direction of said row, then applying an adhesive to said row as it is fed to adhesively connect said portions, and then cutting the wire as it is fed in relation to the bends between the staple length wire portions to continuously form a staple strip consisting of a row of adhesively connected individual staple forming pieces.

5. The method of producing a staple strip continuously, which consists in bending a length of wire to produce a continuous row of integrally connected substantially staple length wire portions and adhesively connecting said portions, and cutting and pointing the wire simultaneously in relation to the bends between the staple length wire portions to continuously form a staple strip consisting of a row of adhesively connected individual staple forming pieces.

6. The method of producing staple strips continuously, which consists in winding a length of wire into a helix to produce a plurality of continuous rows of integrally connected substantially staple length wire portions and adhesively connecting said portions, and cutting the wire in relation to the ends of the staple length wire portions to continuously form a plurality of staple strips each consisting of a row of adhesively connected individual staple forming pieces.

7. The method of producing staple strips continuously which consists in bending a length of wire into a helix to produce a plurality of continuous rows of integrally connected substantially staple length wire portions having bends between them and adhesively connecting said portions, and cutting the wire in relation to the bends between the staple length wire portions to continuously form a plurality of staple strips each consisting of a row of adhesively connected individual staple forming pieces.

8. The method of producing staple strips continuously which consists in winding a length of wire about a mandrel into a helix to produce a plurality of continuous rows of integrally connected substantially staple length wire portions, feeding said helix along said mandrel in a direction parallel to its axis, adhesively connecting said portions, and cutting the wire in relation to the ends of the staple length wire portions to continuously form a plurality of staple strips each consisting of a row of adhesively connected individual staple forming pieces.

9. The method of producing a staple strip continuously which consists in bending a length of wire back and forth upon itself to produce a continuous row of integrally connected substantially staple length wire portions and adhesively connecting said portions, cutting the wire in relation to the bends between the staple length wire portions to continuously form a staple strip consisting of a row of adhesively connected individual staple forming pieces.

MAX VOGEL.