Aug. 8, 1933. R. J. FARRELL 1,921,515

METHOD OF MAKING WIRE NAILS

Filed Oct. 14, 1931 2 Sheets-Sheet 1

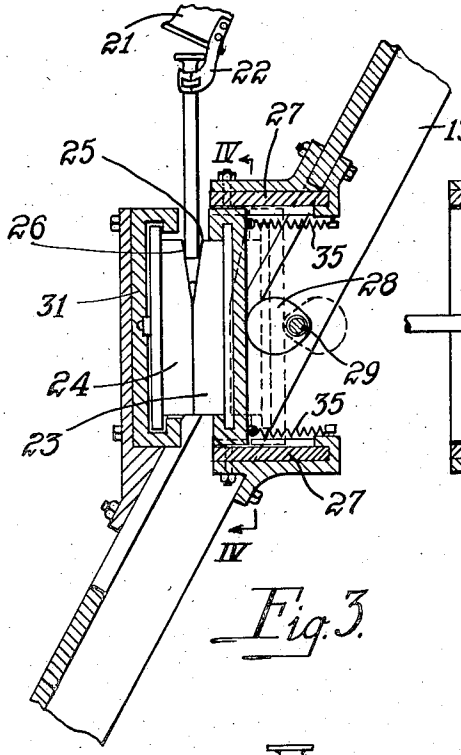


Fig. 3.

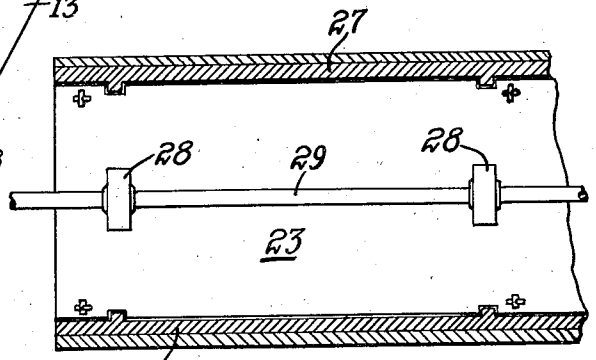


Fig. 4.

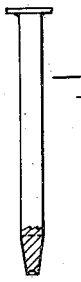


Fig. 6.



Fig. 5.

Fig. 1.

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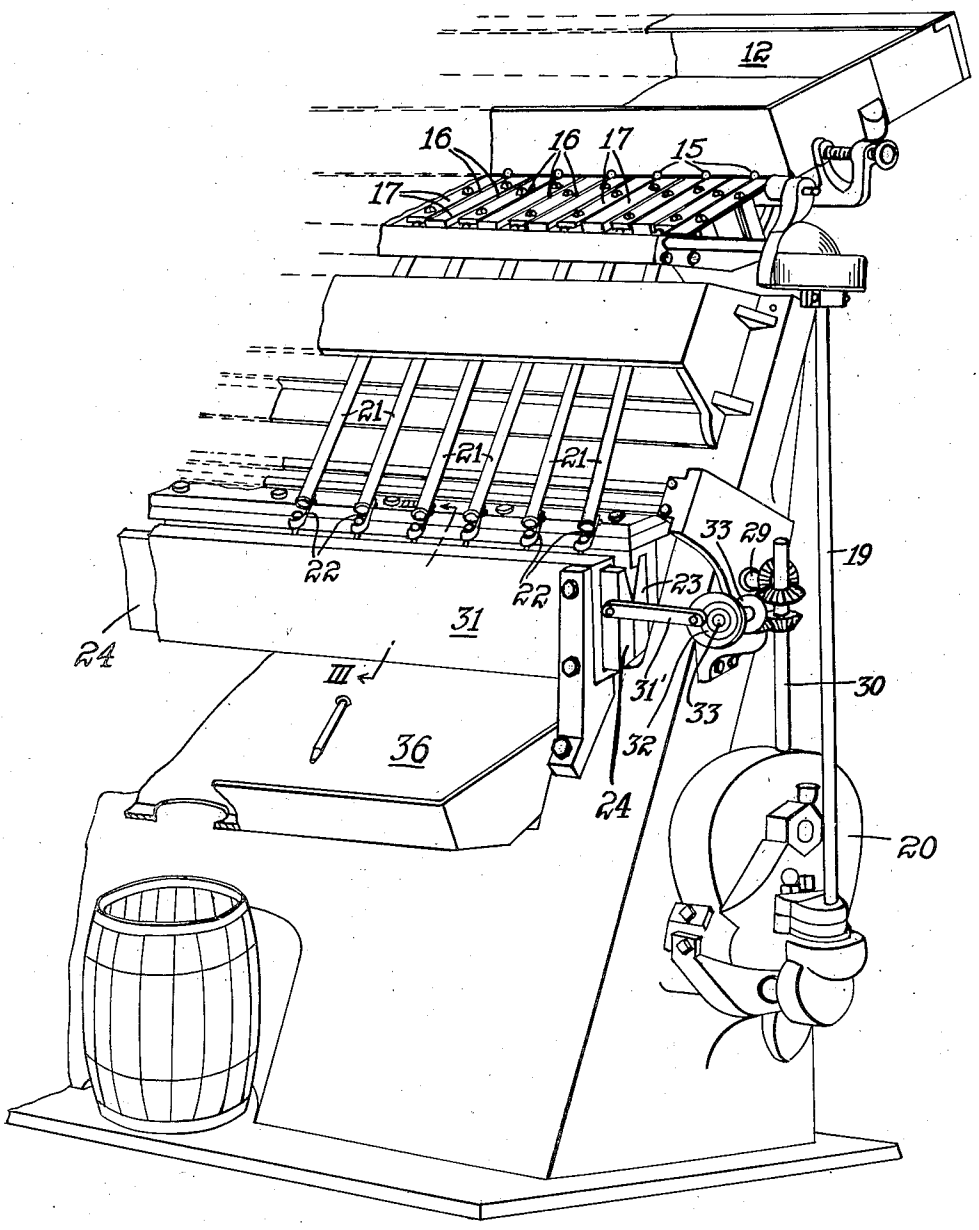


Fig. 2.

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Patented Aug. 8, 1933 1,921,515

UNITED STATES PATENT OFFICE

1,921,515

METHOD OF MAKING WIRE NAILS

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Application October 14, 1931. Serial No. 568,662

12 Claims. (Cl. 10—54)

This invention relates to the method of making wire nails, and in particular, to a method for forming wire nails of the type described in my copending application, Serial No. 561,325 filed September 5, 1931, and is a continuation in part thereof.

One object of this invention is to provide a method for forming wire nails having a tapered entering end terminating in a concave surface.

Another object of this invention is to provide a novel method for forming wire nails of the type disclosed.

A further object of this invention is to provide a method for forming wire nails which materially increases production and eliminates waste and loss through scrap.

These and other objects which will be obvious to those skilled in this particular art are attained by means of my improved process, the mechanism for carrying out the process being illustrated in the accompanying drawings, wherein:

Figure 1 is a view in side elevation of the mechanism for forming the nails;

Fig. 2 is a partial view in perspective of the end pointing mechanism;

Fig. 3 is a view in section taken on line III—III of Figure 2;

Fig. 4 is a view in section taken on line IV—IV of Fig. 3;

Fig. 5 is a view in perspective of the headed nail blank, and

Fig. 6 is a view in elevation of the finished nail, having a portion of the pointed end broken away for convenience of illustration.

In applying my invention to the manufacture of nails having a tapered entering end which terminates in a concave surface, wire is taken from a bundle or coil and fed through straightening rolls into the heading machine. The wire entering the heading machine passes between gripping dies which hold the wire while it is struck with a hammer to form the head. The head is formed with one blow of the heading hammer. As the heading hammer recedes, the headed wire is fed into the machine until a length of wire suitable for making the nail has passed between the gripping dies. The wire is then gripped by the gripping dies and severed in a plane transverse to the axis of the wire.

After the wire is severed, the headed blank drops into a chute which feeds it into a hopper on a pointing machine where it is cleaned or polished. After cleaning, the cut end of the blank is rolled about its longitudinal axis while pressure is so applied to the surface metal adjacent the end of the blank and at such an angle to the longitudinal axis thereof that the surface metal, adjacent the cut end of the blank is extruded or elongated and caused to project beyond the central core thereby whereby a concave surface is formed on the blank transverse of the axis of the nail which is connected to the body of the nail by a tapered surface. By extruding and tapering the surface metal beyond the end of the blank a closed annular cutting edge is secured.

Referring to the drawings in detail, 10 designates a nail-heading machine into which wire is fed from a coil or bundle (not shown). The nail-making machine 10 is of the usual type ordinarily employed in the manufacture of nails and forms the head on the wire being fed thereinto and cuts the wire to the length required for forming the nail. Ordinarily the cutting dies in the machine 10 are designed to sever the wire and cut the entering point on the end of the nail at the same time. In making my improved type of nail the cutting dies in the machine 10 are so shaped that the wire is severed in a plane substantially transverse to the axis of the wire.

After the blank has been headed and cut to length, the nail blank (Fig. 5) drops into a chute 11 and is conveyed into a hopper 12, one corner of which is pivoted to the frame 13 of a nail-pointing machine 14. The hopper 12 is oscillated and swung through an arc so as to cause the nail blanks to be fed through openings 15 and delivered into slots 16 between the edges of members 17. The nail blanks are so fed into the slots 16 that the head of the blank is supported on the edges of the members 17.

The hopper 12 is oscillated so as to feed the blanks through the openings 15 by suitable mechanism 18 geared to a shaft 19. The shaft 19 is driven by a motor (not shown), through suitable gearing contained in a gear box 20.

The nail blanks are fed one at a time from the slots 16 into substantially vertically extending tubes 21 through which the blanks drop into spring clips 22 secured on the ends of the tubes. The clips 22 catch the blanks and position the cut ends thereof between rolling members 23 and 24, the upper edges of the adjacent faces thereof being beveled as at 25 and 26 to form an angle therebetween for receiving the end of the blank. The member 23 is mounted in guides 27 secured to the frame 13 of the pointing machine and is movable into and out of engagement with the member 24 by a series of cams 28 on a shaft 29. The shaft 29 is geared to a shaft 30 which

is rotated by suitable gearing in the gear box 20.

When the cut end of the nail blank has been positioned between the beveled faces of the rolling members 23 and 24 the cams 28 move the member 23 into contact with the member 24 so that the nail blank will be firmly engaged therebetween, at which time member 24 is moved longitudinally to the member 23 causing the nail blank to roll therebetween about its longitudinal axis and form the entering end on the nail. As the adjacent faces of the members 23 and 24 are beveled a rotative pressure or force is applied to the end of the blank at an angle to the longitudinal axis thereof which extrudes and tapers the surface metal and causes it to taper and project annularly beyond the central core of the blank thereby forming a dished out surface terminating in a closed annular cutting edge on the end of the nail.

The rolling member 24 is movably mounted in a guide 31 carried by the frame 13. To move the member 24 lengthwise of the member 23 when the latter member has been forced into contact therewith, a lever 31' connects the member 24 with an eccentric 32 mounted on a shaft 33 driven through suitable gearing by the shaft 30.

The cams 28 are so designed that they press the member 23 firmly against the cut end of the blank during the movement of the member 24 in one direction. As the member 24 moves relative to the member 23, a rotative force is applied to the end of the blank which causes it to roll therebetween about its longitudinal axis and travel with the member 24 whereby it is pulled from the clip 22. The adjacent faces of the members 23 and 24 are so beveled that the rotative force will be applied to the end of the blank at such an angle to the longitudinal axis of the blank that as the blank rolls therebetween the surface metal adjacent the end thereof will be annularly extruded, elongated and projected beyond the central core of the blank and tapered to form a cup-shaped surface on the end of the blank which is transverse to the major axis thereof and connected to the body of the blank by an annular sloping surface. After the entering end has been formed, the cams 28 release the member 23 and spring members 35 pull it out of engagement with the member 24. This separating of the members 23 and 24 permits the finished nail to drop into a hopper 36 from which it is fed into a keg.

By coupling the end of the blank, a tapered entering end is formed on the nail having a closed annular cutting edge which is of slightly smaller diameter than the diameter of the nail and, since the surface metal of the blank is extruded annularly, any section through the entering end is of substantially the same sectional shape as the body of the nail but of reduced area.

In order to clean the body of the nails, a cleansing agent such as sawdust, or any other suitable material, may be placed in the hopper 12. The cleansing agent frictionally engages the nail blanks and as the hopper is swung back and forth, cleanses and polishes the blanks.

It is readily apparent from the foregoing description that I have provided a new and improved method for making nails in which the entering end on the nail is formed by rolling the nail blank about its longitudinal axis while a force is applied to the surface metal of the blank at an angle to its longitudinal axis. Thus, I am able to eliminate the usual and expensive point cutting dies ordinarily employed in nail machines to form the entering end on the blank. Also, in my process production is materially increased since the entering end may be rolled as rapidly as the head can be formed.

While I have disclosed one embodiment of my process, it is understood that certain modifications may be made therein or in the machine for carrying out my process without departing from the spirit of my invention or the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. The method of pointing nail blanks which consists in elongating the outer surface of the blank adjacent the end to impart a taper thereto and project the outer surface beyond the central portion of the blank whereby an entering end is formed which is of reduced size but of substantially the same cross-sectional shape as the body of the nail.

2. A method of pointing and cupping the end of a nail blank, which consists in extruding the surface metal at the end of the blank beyond the central core thereof, and tapering the end of the blank by a swedging operation while said blank is rotating about its longitudinal axis.

3. A method of pointing and cupping the end of a nail blank, which consists in extruding the surface metal at the end of said blank beyond the central core thereof to form a closed cutting edge and in swedging the end of the blank to conical form.

4. A method of pointing and cupping a nail blank, which consists in applying an extruding and rotative force to the end of the blank, and continuing the application of such force to taper the end of said blank.

5. A method of pointing and cupping a nail blank, which consists in applying an extruding and tapering force to the end of the blank while rotating such blank.

6. A method of pointing and cupping a nail blank, which consists in occasioning a relative flow between the surface metal and central core of the blank at the end thereof by the application of an angularly directed rolling force, and in continuing the application of such force to taper the end of said blank.

7. A method of pointing and cupping a nail blank, which consists in extruding the surface metal at the end of the blank by the application of a distorting pressure to the end of the blank at an angle to the longitudinal axis thereof while such blank is rotating, and in progressively increasing the effect of such force on the blank to taper the end thereof.

8. A method of pointing and cupping a nail blank, which consists in rotating the blank about its longitudinal axis while annularly extruding the surface metal at the end of the blank beyond the central core thereof by the application of an angularly directed force to the end portion of the blank, and in continuing the application of such force to taper the end of the blank and the annular extruded portions thereof.

9. A method of pointing and cupping a nail blank which consists in extruding the surface metal at the end of the blank beyond the central core thereof by a die-swedging operation while rotating said blank about its longitudinal axis and in die tapering the end of the blank while continuing said rotation.

10. The method of pointing and cupping a nail blank which consists in rolling the blank about its major axis and in convergently and annularly extruding the surface metal of the blank adjacent the end thereof during the rolling process to taper and cup the end thereof.

11. The method of pointing and cupping a nail blank which consists in elongating the surface metal of the blank adjacent the end thereof to project said surface metal annularly beyond the central core thereof and in tapering the end of the elongated portion of the blank to form a closed annular cutting edge of smaller diameter than the diameter of the body of the blank.

12. The method of pointing and cupping a nail blank which consists in rolling the blank about its major axis and in simultaneously applying an angularly directed force to the end of the blank to annularly extrude the surface metal beyond the central core of the blank and to taper the end thereof.

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