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MACHINE FOR MAKING TACKS

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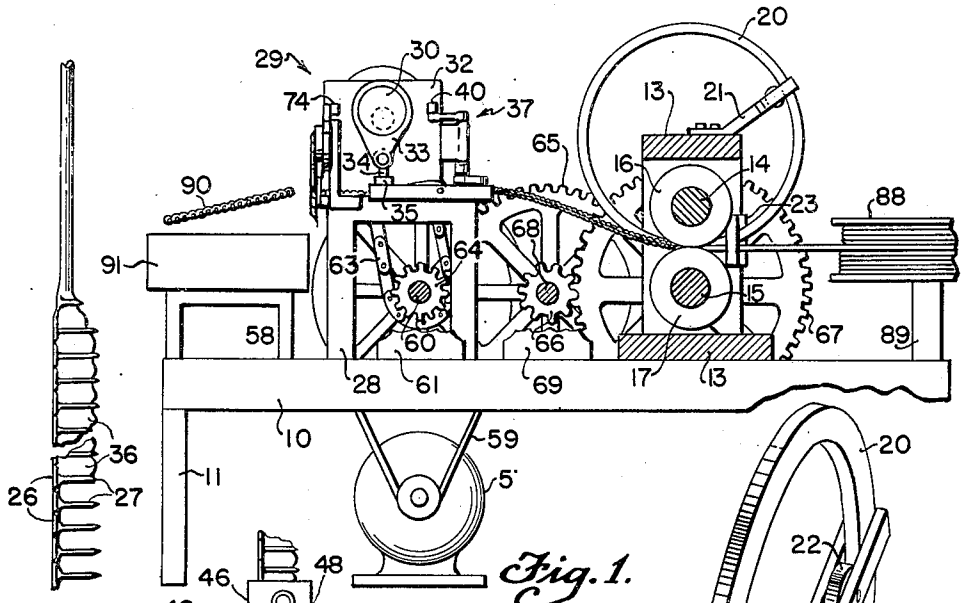


Fig. 1.

Fig. 4.

Fig. 5.

Fig. 3

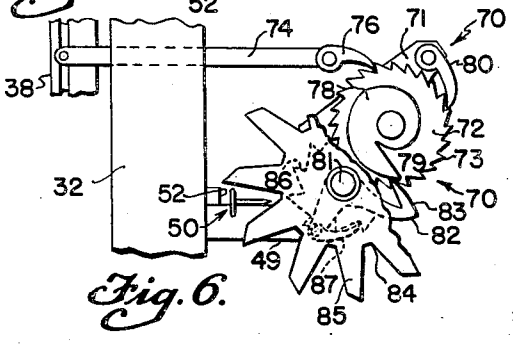


Fig. 6.

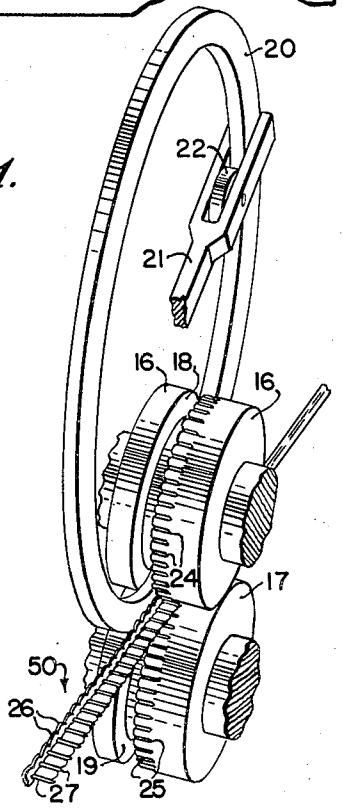


Fig. 2.

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MACHINE FOR MAKING TACKS

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3 Claims. (Cl. 10—55)

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This invention relates to a machine and method for making strips of tacks joined along the opposite sides of their heads for use in a magazine type tack hammer such as described in U. S. Patent No. 2,425,494, issued to A. M. Taylor on August 12, 1947. This application relates in part to my co-pending application, Serial No. 134,956, filed December 24, 1949.

An object of the invention is to provide a means and method for making tacks of the described class whereby relatively few operations are required.

A particular object of the invention is to provide a means and method for nearly completely forming tacks of the described class by using a single set of roll dies.

Another object of the invention is to provide a means and method for removing flash or excess material which may result from the forming operation referred to in the foregoing object.

A further object of the invention is to provide, in a pair of roll dies for forming tacks, a means whereby the heads of the tacks are prevented from being formed in a direction away from the lengths of their respective shanks.

These and other objects of the invention will become apparent from the following description and the accompanying drawings, wherein:

Figure 1 is a broken side elevation of a machine for making tacks of the described class, and embodying the features of the present invention.

Figure 2 is an enlarged perspective view of the roll dies, and particularly showing the arrangement of a backing ring for preventing the heads of the tacks from expanding outwardly with respect to the lengths of the tack shanks.

Figure 3 is a vertical sectional view of the roll dies where they contact each other, and showing the position of the backing ring with respect thereto.

Figure 4 is a broken plan view of a length of round stock and showing the progressive formation of the tacks made therefrom in accordance with the present invention.

Figure 5 is an enlarged plan view of the trim die illustrated in Figure 1, and additionally showing a suggested means for cutting the length of formed tacks into short strips for use in a magazine type tack hammer.

Figure 6 is a broken elevation of the cutting means illustrated in Figure 5.

The machine illustrated in Figure 1 includes a frame or bed 10 supported on legs 11. Upon the frame 10 there is a bearing support 13 which rotatably supports the shafts 14 and 15 of a pair of roll dies 16 and 17, respectively, and which dies are arranged in contact with each other in a vertical position. The roll dies 16 and 17 are respectively provided with annular grooves 18

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and 19 which accommodate a backing band or ring 20. As shown in Figure 1, the ring 20 is supported by a bracket 21 mounted on the bearing support 13, and which bracket is bifurcated at its outer end where it rotatably supports a roller 22 for engaging the inner periphery of the ring 20. An additional guide member 23 may be secured to the bearing support 13 and arranged for slidably engaging the ring 20 in front of the roll dies 16 and 17. Cavities 24 and 25, each defining one-half a tack, are formed in the cylindrical surfaces of the roll dies 16 and 17. The head ends of the respective cavities 24 and 25 open into each other so as to form the strips to be described. As particularly shown in Figure 3, the head ends of the cavities 24 and 25 are open toward one side of the ring 20, and whereby the latter will maintain a flat surface on the heads 26 of the tacks to be formed. The lengths of the cavities 24 and 25, as will be seen, will form the tack shanks 27. Although not shown in the drawings, the roll dies 16 and 17 are geared to each other and are arranged so that the cavities 24 and 25 will coincide with each other.

Mounted on the frame 10, by means of a support 28, there is a trim die 29 which is arranged opposite and slightly higher than the roll dies 16 and 17. The form of trim die illustrated includes an eccentric 30 on one end of a shaft 31 journaled in a vertical support 32. A connecting rod 33 slidably engages the eccentric 30 at one end thereof, and whereas the other end is pivotally connected with a punch 34 which operates in a guide 35 secured to the face of the vertical support 32. The end of the punch 34 is shaped to remove the flash 36, which may exist between the tack shanks 27.

A hitch feed 37 is provided between the trim die 29 and the roll dies 16 and 17 and is operated by a cam 38 mounted on the trim die shaft 31. The cam 38 is cylindrical in shape and is provided with a cam groove 39 around its outer surface. A slide 40 is transversely mounted in the die support 32 and has a laterally projecting pin 41 for engaging the sides of the cam groove 39. A vertical bracket 42 is secured to one side of the die support 32 and pivotally supports a vertical shaft 43. The upper end of the shaft 43 is connected with the end of the slide 40 opposite its projection 41 by means of an arm 45. The connection between the slide 40 and the arm 45 may be made relatively loose so as to accommodate the change from linear motion into angular motion. The lower end of the vertical shaft 43 is similarly provided with an arm 46 which is connected with a feed bar 47 by means of a link 48 pivotally connected therebetween. The feed bar 47 is arranged for reciprocating movement on a horizontal support 49 formed by the upper

end of the die support 28. The strip of tacks 50 discharged from the roll dies 16 and 17 are received on top of the horizontal support 49 and beneath the feed bar 47. As shown in Figure 5, the horizontal support 49 is provided with a shoulder 52 for guiding the feed bar 47. There is a pawl 53 pivotally mounted in an opening 54 in the feed bar 47 by means of a pivot pin 55, and which pawl is arranged to engage the shanks 27 of the strip of tacks 50 and feed the latter toward the punch 34 of the trim die 29. An elongated opening 56 is also formed through the feed bar 47 to accommodate the punch 34.

Beneath the frame 10 there is a motor 57 which drives a pulley 58 by means of a belt 59. The pulley 58 is mounted on a shaft 60 journaled in a supporting member 61 and secured to the frame 10. There is a sprocket (not shown) mounted on the shaft 60 which drives the sprocket 62 mounted on the trim die shaft 31 by means of a chain 63. One of the roll die supporting shafts 15 is also driven by the last referred to shaft 60 through a train of reduction gears 64, 65, 66 and 67. The first referred to gear 64 of the train is mounted on the drive shaft 60, whereas the intermediate gears 65 and 66 are mounted on an intermediate shaft 68 journaled in a supporting member 69 mounted on the frame 10. The last gear 67 of the train is mounted on the roll die shaft 15.

The tack strip cutting mechanism 70 illustrated in Figures 5 and 6 is optional and is not necessarily a part of the present invention. The cutting mechanism 70 shown is comprised of a bracket 71 supported by the die support 32 and has a vertically disposed ratchet wheel 72 mounted thereon. The number of teeth 73 around the circumference of the wheel 72 correspond in number with the number of tacks to be cut from the original strip of tacks 50. The wheel 72 is actuated by a rod 74 slidably positioned through the die support 32 and has a lateral projection 75 for engaging the sides of the cam groove 39. The opposite end of the rod 74 is provided with a pawl 76 for engaging the rachet wheel teeth 73, The side of the wheel 72 includes a cam 78 having an abrupt fall 79 in its periphery. A locking pawl 80 is pivotally mounted on the upper end of the bracket 71 and is arranged to engage the teeth 73 so as to prevent counter rotation of the wheel 72. A stub shaft 81 projects from one side of the bracket 71 and pivotally supports an L-shaped follower 82 which operates in the manner of a bell crank. One end of the follower 82 is in the form of an abrupt turn 83 for coaction with the fall 79 of the ratchet wheel cam 78. A circular knife 84 is also mounted on the stub shaft 81 and has radially directed blades 85 arranged to receive the strip of tacks 50 therebetween as the latter is discharged from the feed bar 47. One face of the circular knife 84 is provided with rachet teeth 86 which coact with a pawl 87 secured to the end of the L-shaped follower 82 opposite the abruptly turned end 83. It is to be understood that the last described pawl 87 and the follower 82 are spring loaded so as to make constant contact with the last described rachet teeth 86 and with the cam 87, respectively.

The strip of tacks 50 may be formed of bar or wire stock which is preferably supported on

a reel 88 rotatably mounted on a standard 89 secured to the frame 10. As the stock is fed between the roll dies 16 and 17, the previously described tack heads 26 and tack shanks 27 are formed, and usually have a certain amount of flash 36 between the said shanks. The strip of tacks 50 is then fed to a position beneath the punch 34 by means of the reciprocating hitch feed 37. It will be noted that the action of the cylindrical cam 38 is such that the hitch feed pawl 53 has the same number of strokes as the punch 34. After the punch 34 has removed the excess flash 36 from between the tack shanks 27, the strip of tacks 50 is fed between adjacent blades 85 of the circular knife 84. By reason of the action of the described cutting mechanism 70, the strip of tacks 50 is cut into short lengths 90 and which fall into a box 91 supported on the frame 10.

The described form of the invention is not restrictive, but may be made in many ways within the scope of the appended claims.

What is claimed is:

1. A machine forming strips of tacks joined along opposite sides of their heads and having their shanks projecting perpendicularly with respect to the length thereof, said machine comprising a pair of roll dies each having coinciding tack-shaped cavities around the cylindrical surfaces thereof for nearly completely forming said strips of tacks, a trim die including a reciprocating punch forming a part thereof, said die being arranged for receiving the strip of tacks discharged from said roll dies, and a hitch feed positioned between said roll dies and said trim die, and means synchronizing said hitch feed with said trim die whereby the punch of the latter operates between the shanks of the tacks for removing flash therefrom.

2. A machine for forming strips of tacks joined along opposite sides of their heads and having their shanks projecting perpendicularly with respect to the length thereof, said machine comprising a pair of roller dies each having tack-shaped cavities around the cylindrical surfaces thereof, the cavities in one said die being arranged to match the cavities in the remaining said die, and wherein the said cavities in each said die are joined with each other along the head portions thereof, and means removing the flash formed between the shank portions of the resulting tack strips as they emerge from said dies.

3. In a machine for forming strips of tacks joined along opposite sides of their heads and having their shanks projecting perpendicularly with respect to the length thereof as defined in claim 2, the construction wherein said roller dies have annular grooves in the cylindrical surfaces thereof and joining said tack shaped cavities at the head ends thereof, and a backing ring received within said annular grooves.

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REFERENCES CITED

The following references are of record in the file of this patent:

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