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C. E. DANIELS

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PENCIL MAKING MACHINE

Filed Nov. 13, 1926

Fig. 1.

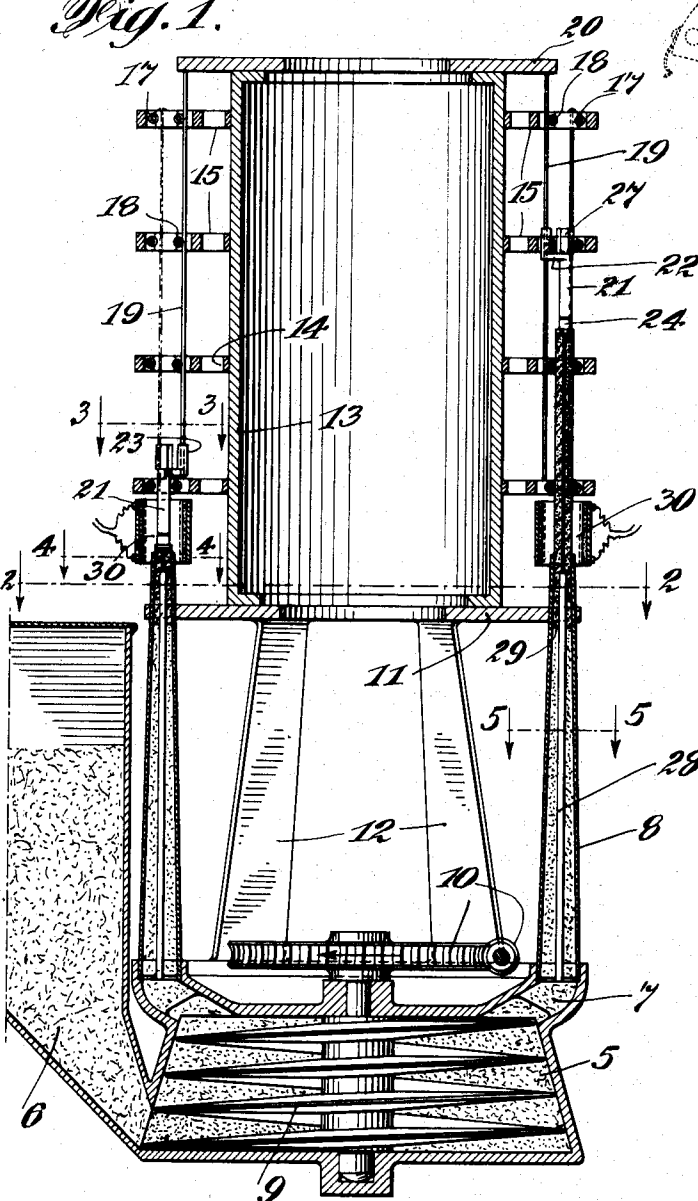


Fig. 3.

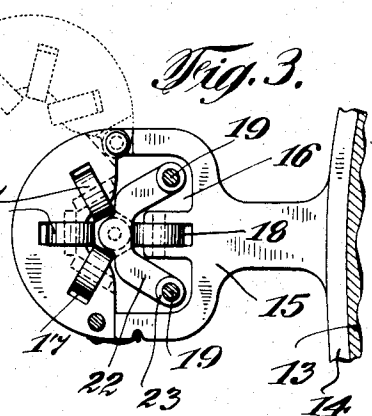


Fig. 4.

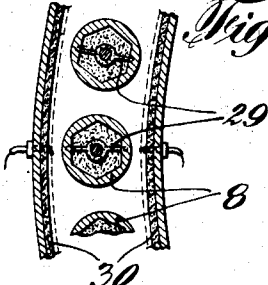


Fig. 5.



Fig. 6.

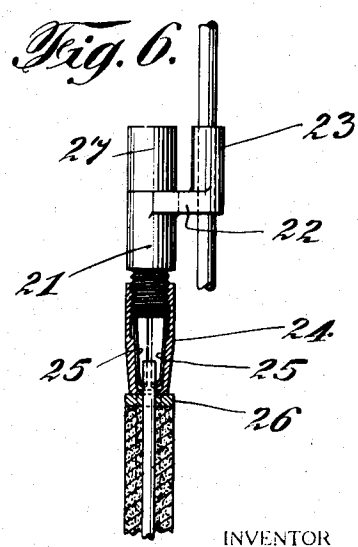
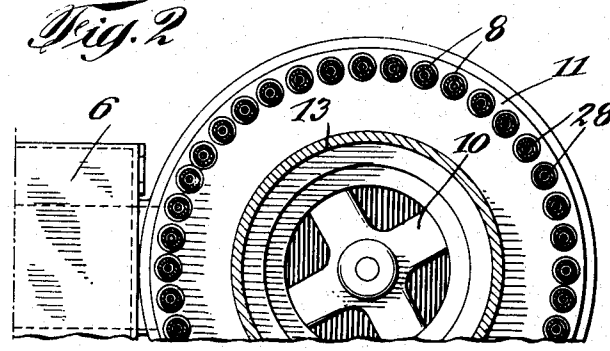


Fig. 2.



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## UNITED STATES PATENT OFFICE.

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## PENCIL-MAKING MACHINE.

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This invention relates to pencil making machines, and has for its primary object to provide an apparatus of relatively simple construction for simultaneously making a plurality of pencils.

It is one of the important features of the present invention to provide improved means for simultaneously feeding a plastic wood or paper mass together with a central lead or crayon core from a shaping nozzle and subjecting said mass at the nozzle outlet to the action of heat to progressively solidify the same and thereby render the enveloping plastic mass rigid and inflexible.

It is another object of my invention to provide improved means for guiding and directing the formed pencil after leaving the shaping nozzle.

With the above and other objects in view, the invention consists in the improved pencil making machine, and in the form, construction and relative arrangement of the several parts, as will be hereinafter more fully described, illustrated in the accompanying drawings, and subsequently incorporated in the subjoined claims.

In the drawings, wherein I have disclosed one simple and satisfactory embodiment of my invention, and in which similar reference characters designate corresponding parts throughout the several views,—

Figure 1 is a vertical sectional view through the machine illustrating one practical embodiment of my present improvements;

Fig. 2 is a fragmentary horizontal section taken substantially on the line 2—2 of Fig. 1;

Fig. 3 is a detail horizontal section taken on the line 3—3 of Fig. 1;

Figs. 4 and 5 are similar detail sectional views taken on the lines 4—4 and 5—5 respectively, of Fig. 1, and

Fig. 6 is a detail view partly in section of the lead feeding device.

Referring in detail to the drawings, as herein shown, the machine includes a base having a pulp receiving chamber 5 of suitable capacity which is fed from a reservoir 6 communicating with said chamber at one side thereof. A plurality of outlets 7 lead from the top of this chamber to an annular series of vertically disposed tapering shaping nozzles 8 through which the material is

forced under pressure from chamber 5 by the rotatively mounted worm 9 arranged in said chamber and driven by suitable gearing or other equivalent means indicated at 10.

A horizontally positioned bed plate 11 is arranged above and in spaced relation to the base of the machine and preferably connected therewith by a number of standards 12. The upper ends of the shaping nozzles 8 extend through suitably formed openings in this bed plate. Upon the bed plate 11 the lower end of a hollow cylinder 13 is suitably fixed, and surrounding said cylinder and secured to the wall thereof of the vertically spaced rings or bands 14 are arranged, each of said bands being provided with a plurality of radially extending arms 15 each having an opening 16 therethrough. In each arm 15 at the outer side of the opening a series of guide rollers 17 are arranged and radially positioned with respect to the axial center line of one of the shaping nozzles 8. An additional roller 18 is also suitably mounted in the opening 16 in opposed spaced relation to the central roller 17.

Spaced vertically extending guide rods 19 are positioned through the openings 16 of the arms 15 and suitably fixed at their lower ends to the lowermost arms 15 and at their upper ends to a plate 20 secured to the upper end of the cylinder 13.

Upon each pair of rods 19, a lead feeding member is arranged for vertical sliding movement. As herein shown, this member consists of a cylindrical shank 21 having divergently extending arms 22 each provided with an upwardly projecting sleeve 23 loosely engaged upon one of the rods 19. The lower end of the shank 21 is provided with suitable means for gripping one end of the lead or crayon. As seen in Fig. 6, this lead receiving and gripping means may consist of a sleeve 24 threaded upon the reduced lower end of the shank 21 and having arranged therein a plurality of resilient gripping dogs or springs 25 fixed to the wall of said sleeve at one of their ends. The other free ends of these spring dogs are so formed as to securely grip the end of the lead inserted into the sleeve 24. The lower end of the sleeve is provided with an apertured collar or washer 26 substantially corresponding in shape and dimensions with the cross sectional form of the body of the

pencil. At its upper end, the shank 21 is preferably provided with a longitudinally extending part 27 also of the same cross sectional form as the pencil which is adapted  
5 to pass between and engage with the several guide rollers 17 and 18.

Within each nozzle 8 a tube 28 is axially positioned, said tube at its lower end being suitably braced from the wall of the nozzle  
10 and also connected with said nozzle wall at a point in spaced relation to the upper end of the latter by means of the webs indicated at 29. The tube 28 at its upper end terminates below the upper open end of the nozzle  
15 8. As herein shown, this nozzle is of internal hexagonal cross sectional shape, but of course if desired, may be of other forms. The upper end of each nozzle projects within the chamber of an electrical heating device  
20 30 of tubular form.

In the operation of the machine above described, assuming that the chamber 5 has been supplied with a pulp mass of paper, wood or suitable composition, when the  
25 worm 9 is rotated, said pulp will be forced upwardly through the several nozzles 8 under pressure. As these nozzles gradually taper towards their upper ends, the pressure upon the material gradually increases, thereby closely compacting the fibers in a homogeneous mass which is finally extruded from  
30 the upper end of the nozzle in the desired cross sectional form. It is of course, understood that a lead has been inserted into the tube 28 of each nozzle and connected at its upper end with the lead feeding member  
35 shown in Fig. 6. As the plastic material is forced from the upper end of the nozzle 8 in engagement with the collar 26 at the lower end of the feeding device, said device is of course, forced upwardly along the guide  
40 rods 19. The compacted pulp mass immediately entering the tubular chamber 30 is subjected to a high heat so that the moisture is evaporated therefrom and the plastic material becomes hard and rigid. Therefore,  
45 under the continued upward pressure of the mass within the nozzle 8, the hardened pulp and the lead core will be fed progressively upwardly between the successive series of  
50 guide rollers 17 and 18 to produce a pencil of the desired length. The lead gripping devices may then be readily disconnected from the upper ends of the lead cores and the lower ends of the formed pencils cut off  
55 at the upper ends of the nozzles 8 and then removed. In this manner, it is possible to very rapidly produce perfectly formed pencils of the desired cross sectional shape and  
60 length.

From the foregoing description, the several advantageous features of my present invention will be fully and clearly understood. It will be seen that the necessary apparatus  
65 consists of comparatively few parts which

are of simple form so that said apparatus is not likely to get out of order, and may also be produced at comparatively small manufacturing cost. While I have herein  
shown an embodiment of my present improvements which I believe to be entirely  
70 practical and efficient in operation, it will nevertheless, be understood that the several essential features thereof might also be exemplified in numerous other alternative  
75 structures, and I accordingly reserve the privilege of resorting to all such legitimate changes in the form, construction and relative arrangement of the several parts as may be fairly incorporated within the spirit and  
80 scope of the invention as claimed.

I claim:

1. In a machine for making pencils, a plurality of vertically disposed shaping nozzles, means for feeding a plastic pulp mass  
85 under pressure upwardly through said nozzles, and means actuated by the mass extruded from the outlet ends of the nozzles for simultaneously and progressively feeding a lead core embedded in the plastic mass  
90 through the mouth of each shaping nozzle.

2. In a machine for making pencils, a plurality of vertically disposed shaping nozzles, means for feeding a plastic pulp mass under pressure upwardly through said nozzles, means actuated by the mass extruded  
95 from the outlet ends of the nozzles for simultaneously and progressively feeding a lead core embedded in the plastic mass through the mouth of each shaping nozzle, and means for heating the molded plastic mass as it leaves the nozzle mouth to evaporate the moisture content thereof.  
100

3. In a machine for making pencils, a plurality of vertically disposed shaping nozzles, means for feeding a plastic pulp mass under pressure upwardly through said nozzles, means actuated by the mass extruded from the outlet ends of the nozzles for simultaneously and progressively feeding a  
110 lead core embedded in the plastic mass through the mouth of each shaping nozzle, means for heating the molded plastic mass as it leaves the nozzle mouth to evaporate the moisture content thereof, and guiding means for the lead feeding device and the body of the pencil arranged above said heating means.  
115

4. In a machine for making pencils, a plurality of vertically disposed shaping nozzles, means for feeding a plastic pulp mass under pressure upwardly through said nozzles, means actuated by the mass extruded from the outlet ends of the nozzles for simultaneously and progressively feeding a  
120 lead core embedded in the plastic mass through the mouth of each shaping nozzle, means for heating the molded plastic mass as it leaves the nozzle mouth to evaporate the moisture content thereof, said lead feed-  
125 130

ing means including a member having means to grip the end of the lead at one of its ends and provided with spaced sleeves at its other end, rigid guide rods upon which  
5 said sleeves are loosely engaged, and vertically spaced sets of guide rollers between which the pencil body is received and guided in its upward movement.

5. In a machine for making pencils, a  
10 plurality of shaping nozzles, means to feed a plastic pulp mass under pressure through said nozzles, means actuated by the mass extruded from the outlet ends of the nozzles for progressively feeding a core through the  
15 mouth of each nozzle, and means embracing the outlet ends of the nozzles to evaporate

the moisture from the mass as it emerges from the outlet ends of the nozzles.

6. In a machine for making pencils, a plurality of shaping nozzles, means to feed 20 a plastic pulp mass under pressure through said nozzles, means actuated by the mass extruded from the outlet ends of the nozzles for progressively feeding a core through the mouth of each nozzle, and a heating element 25 embracing the outlet end of each nozzle to heat the mass as it emerges from the nozzles to evaporate its moisture content.

In testimony that I claim the foregoing as my invention, I have signed my name 30 hereto.

CHARLES E. DANIELS.