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Z. LORENIAN

2,790,202

METHOD AND APPARATUS FOR MANUFACTURING PENCILS

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3 Sheets-Sheet 1

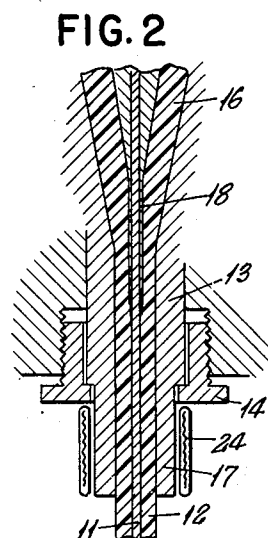
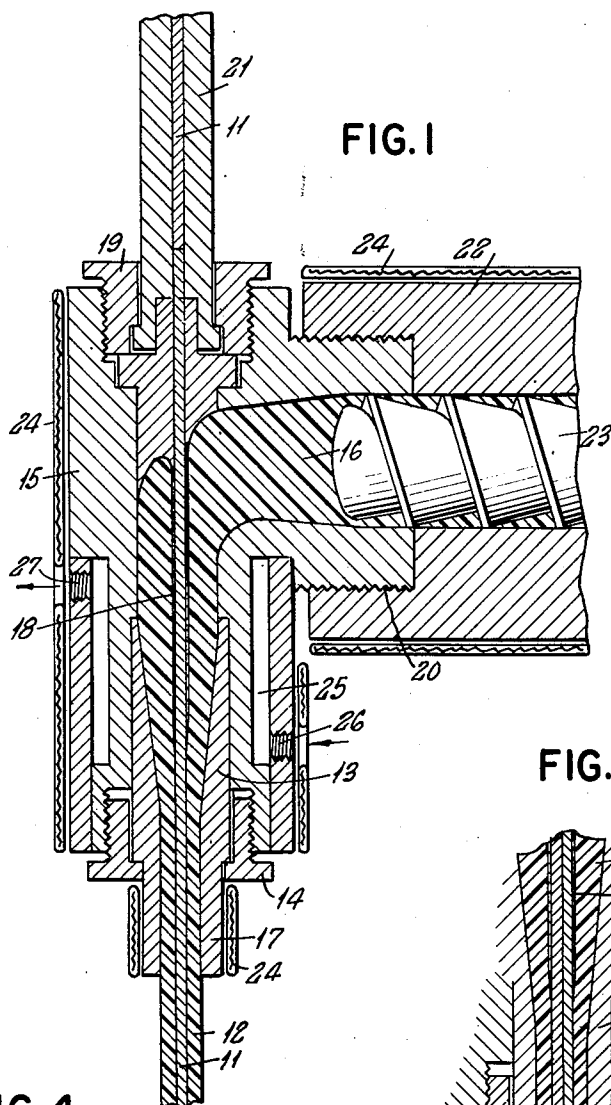


FIG. 3

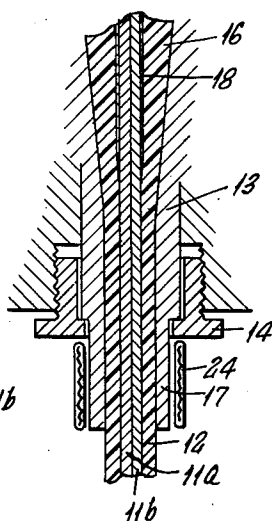


FIG. 4

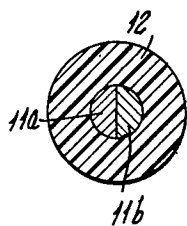
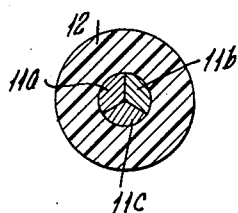


FIG. 5



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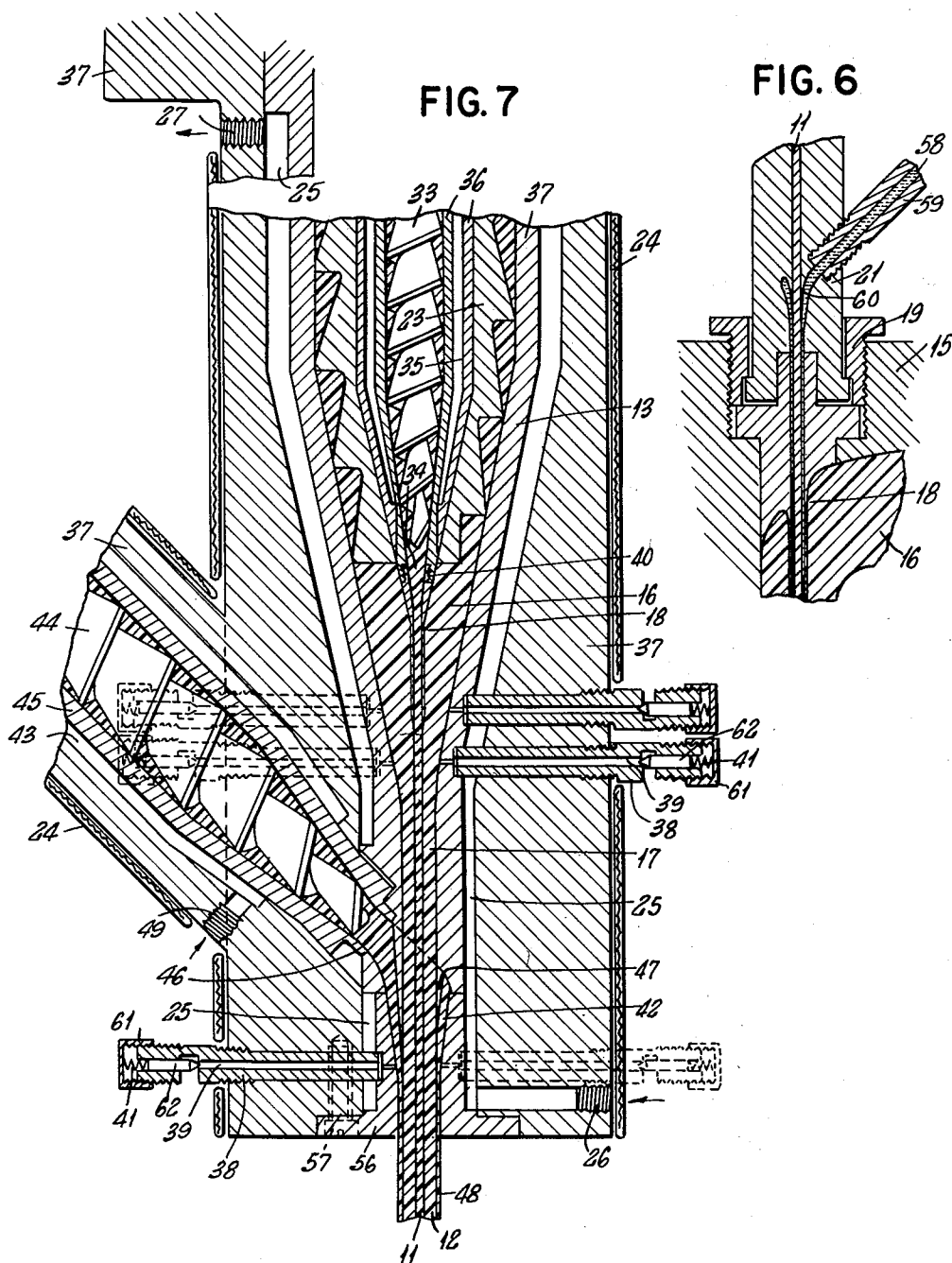
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FIG. 8

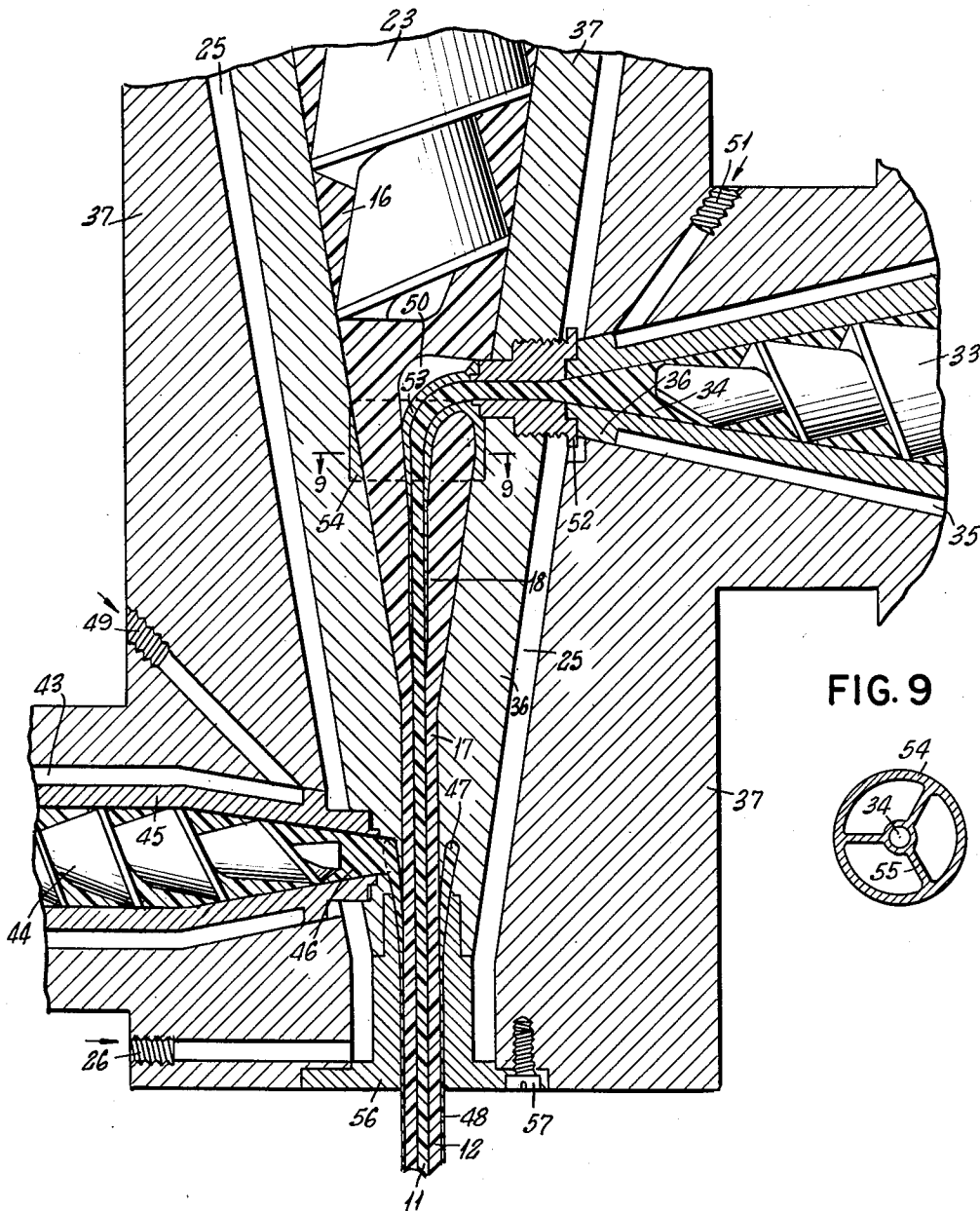
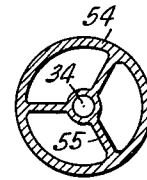


FIG. 9



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METHOD AND APPARATUS FOR MANUFACTURING PENCILS

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Application March 31, 1952, Serial No. 279,496

12 Claims. (Cl. 18—13)

The present invention relates to a method and to apparatus for manufacturing pencils. This application is a continuation-in-part of my application Serial No. 19,788, filed April 8, 1948, which has now become abandoned.

At present pencils are made by one of the four following methods:

1. The lead (marking material) is placed centrally between the two halves of a wooden sheath or envelope which are glued together along the entire length of the pencil.

2. The lead is sheathed in an envelope made by rolling a paper band around the lead. This envelope is progressively unrolled as the lead wears down.

3. The pencil may be formed by the lead itself without any special envelope, the lead being simply covered with an adequate coat of varnish.

4. A permanent sheath or envelope is made from wood, plastic, or metal, and changeable leads are introduced into and fed through this envelope by mechanical feeding means.

The first and second methods of manufacturing a pencil have many disadvantages. They consume a large amount of good quality wood, such as cedar, linden, poplar, etc. or a special type of paper. They require a series of expensive operations, and demand complicated machines, and skilled workmanship. Moreover, in pencils made by either the first or second method the leads are subject to easy breakage on account of drying of the wood, or original unprecise dimensioning of the diameter of the channel in which the lead is placed, or because of imperfect gluing, or imperfect rolling of the paper sheathing band.

The third method is limited to use in producing special purpose pencils. Moreover, it requires expensive labor, whether the varnish coating be applied by immersion, pressure, or by forced coating.

The fourth method means an initial relatively large investment because of the expensive sheath or envelope. Moreover, in mechanical pencils the feeding mechanism often jams, or the lead breaks. Such pencils have other drawbacks also.

The primary object of the present invention is to provide a process and apparatus which permit the manufacture of pencils, or coated marking devices, by a simple, inexpensive process which avoids all the disadvantages of the prior methods mentioned above.

A concomitant object of the invention is to provide a process and apparatus for making pencils from relatively inexpensive sheathing materials so that the pencils can be sold at a price that will compare favorably with pencils produced by either of the first two conventional methods listed above.

A further object of the invention is to provide a process and apparatus for making pencils in which the sheath will be adhered to the lead more firmly than by any previously known process of making pencils.

Other objects of the invention will be apparent here-

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inafter from the specification and from the recital of the appended claims.

In the process and apparatus of making pencils according to the present invention, sheathing material in a thermoplastic state is fed over and around the lead to adhere it to the lead. The lead itself may be in rigid pieces, or it may be shaped in thermoplastic condition to form the core of the pencil before the thermoplastic sheath covers it. In practicing the invention, apparatus is employed having a pair of nozzles arranged one within the other.

The rigid marking core or the thermoplastic marking material is fed through the inner nozzle and the sheath material is fed through the outer nozzle both being continuously fed by extrusion screw presses or the like. Both marking material and sheath progress in the same direction. The rigid marking core, or the thermoplastic marking material, is accurately guided in the marking core nozzle over the final part of its length. The warm sheath material progressing in its nozzle glides over the marking core nozzle which is thin-walled. On reaching the zone and in the zone where it unites with the marking core, which zone is at a point spaced from the beginning of the narrowest cross section of the sheath material nozzle, the sheath material is pre-shaped inside to correspond to the cross section of the marking core in such a manner and so far that the sheath material, almost without changing its inner cross section and its direction, and without damaging the marking core, is deposited by gliding movement on and around the marking core and is united therewith. The sheathed marking core is then guided through the cylindrical outlet of the external nozzle whereby the pencil obtains definitive shape.

The portion of the sheath material nozzle adjacent its discharge end has a cylindrical bore. The marking core nozzle terminates at a distance from the beginning of the cylindrical bore of the sheath material nozzle. The marking core nozzle has at least in the part which is adjacent its discharge end a wall thickness smaller than the diameter of its bore. The marking core nozzle ends before the sheath material nozzle and is preferably sharpened externally at its discharge end. The marking core nozzle over some length adjacent its discharge end has a bore whose cross section corresponds to the cross section of the marking core.

If the marking cores, which are to be sheathed, are rigid, for example ceramic marking cores, said cores may be coated with an adhesive before uniting them with the sheath material to give a stronger adhesion between the rigid marking core and the sheath material.

By using the same principle as is employed in sheathing the lead, the sheathed pencil may also be coated with a thin thermoplastic external coating after the marking core has been united with the sheath and while the sheath is still in warm plastic condition. For this purpose a third nozzle is provided. The thermoplastic external coating material is introduced, for example, by a feed screw into this third coating nozzle which preferably forms part of, or is secured in, the sheath material nozzle. The thermoplastic coating material slides on the sheath material nozzle which is thin-walled at its discharge end; and the third nozzle is pre-shaped inside almost to the cross section of the pencil so that upon reaching the zone and in the zone where the coating material unites with the pencil, which zone is at a point spaced from the beginning of the narrowest cross section of the coating nozzle, the coating material is pre-shaped inside to the cross section of the pencil in such manner that almost without changing its inner cross section and its direction and without damaging the pencil, the coating material is deposited with a gliding movement on and around the

pencil and is united therewith. The coated pencil is then guided through the discharge end of the coating nozzle which is preferably cylindrical inside, so that the pencil obtains its finished covering.

In the drawings:

Fig. 1 is an axial section through apparatus built according to one embodiment of this invention for production of pencils with rigid cores;

Fig. 2 is a fragmentary section, similar to part of Fig. 1, showing part of a modified form of nozzle for feeding the sheathing material over the core;

Fig. 3 is a fragmentary section similar to the sections of Fig. 2, showing a nozzle for the core through which more than one core can be simultaneously fed into the nozzle for the sheathing material;

Fig. 4 is a transverse section of a pencil having two leads such as may be produced by the apparatus of Fig. 3;

Fig. 5 is a transverse section of a pencil with three leads in its core which may also be produced by the apparatus of Fig. 3;

Fig. 6 is an axial section, showing a modified form of apparatus, in which the rigid lead core is covered with an adhesive before its envelopment by the sheathing material;

Fig. 7 is an axial section, similar to Fig. 1, through a further embodiment of the invention in which the core material is in plastic form and is fed concentrically to the plastic sheathing material, and in which both the core material and the sheathing material are fed by means of screws and in which a third feed screw is placed at the side of the sheathing nozzle for delivering a coating material onto the sheathed pencil;

Fig. 8 is a section similar to Fig. 7 showing a still further modification of the invention in which the core and the coating in plastic form are carried into the apparatus in directions at right angles to the directions of movement of the sheathing material; and

Fig. 9 is a section on the line A—A of Fig. 8 looking in the direction of the arrows.

Referring now to the drawings by numerals of reference, 11 denotes the core of the pencil, the lead, the marking material. In some instances, as will appear herein-after, rigid, preformed lead is used as the core; and in other instances the core is formed from thermoplastic marking material in the apparatus of the present invention in the process of making the pencil. The cover or sheath of the pencil is denoted at 12. 16 denotes the sheathing material in its thermoplastic state. 13 denotes the nozzle for forming and shaping the sheathing material; and 18 designates the nozzle through which the lead or marking core 11 is fed. 15 designates a support in which both nozzles are mounted. The nozzle 18 has a bore to suit the shape of the lead 11. The nozzle 13 is provided with a bore to produce the desired outside shape of the sheath.

In the apparatus of Figs. 1 to 3 inclusive, the nozzle 13 is secured in the body 15 by means of a nut 14. This nut engages a shoulder on nozzle 13 and threads into body 15. The nozzle 18 is fastened by means of a nut 19 in the body 15 of the apparatus. The nozzle 18 has an external shoulder that fits in a correspondingly-shaped recess in body 15 and the nut 19 threads into the body 15 to abut at its inner end against the outer face of nozzle 18.

In the apparatus shown in Fig. 1, rigid pre-formed leads are used for forming the cores of the pencils. In Fig. 1 two such leads are shown disposed one abutting the other. When rigid leads such as are shown in Fig. 1 are used, the lead, which is to form the core the next pencil to that being manufactured in body 15, is held in tube 21 which is also secured to body 15 by the nut 19. This tube is counterbored at its discharge end to receive the inlet end of nozzle 18; and it is formed with an external shoulder that fits into a counterbore in the inner end of nut 19.

The nozzle 13 has a part 17 whose bore is cylindrical

corresponding to the external shape of the pencil which is to be produced.

The body 15 of the apparatus is threaded into the cylinder 22 of a conventional screw press by means of the thread 20. 23 indicates a part of the feed screw of the press which feeds the sheathing material into the body 15 and nozzle 13.

The body member 15 is cored out with a right-angle bore to permit flow of the sheathing material 16 there-through around nozzle 18 and into nozzle 13.

The nozzle 18 for the core 11 consists of an upper thicker part and a lower very thin-walled part. The wall thickness of the lower part is smaller than the diameter of the bore of nozzle 18. The diameter and shape of the nozzle 18 corresponds at least adjacent its discharge end to the transverse shape of the core 11, in order that the core may be securely held and fed into the sheathing material 16.

The nozzle 13 has a bore which is conical at its inlet end and which tapers toward the cylindrically-bored part 17. In order to attain smooth transition of the sheathing material from around the nozzle 18 to the core 11 with the least possible change in transverse section, the thin-walled nozzle 18 is preferably further thinned at its discharge end. Furthermore, the discharge end of the nozzle 18 lies at a distance from the beginning of the part 17 of the nozzle 13 which is the narrowest transverse section of nozzle 13. The nozzle 18 is so arranged in the nozzle 13 that the thermoplastic sheathing material 16 can glide a sufficient distance on the nozzle 18 and can cover completely the thinned walled nozzle 18 so that it will join smoothly the lead 11 as the lead emerges from the discharge end of the nozzle 18.

Heating coils 24 surround both the cylinder 22 and the body 15 to keep the sheathing material in thermoplastic condition until the pencil is formed. Channels 25 are also provided in the body 15 for coolant or a temperature-controlling medium. The coolant, or temperature-controlling medium is introduced into the channel 25 through an inlet port 26 in a sleeve which is welded to body 15. It is carried away through an outlet 27 in the same sleeve. The coolant or temperature-controlling medium helps set the sheathing material so that as the sheathed lead 11 leaves the discharge end of nozzle 13, the sheath 12 is firm and securely attached to lead 11, forming with lead 11 a pencil.

Fig. 2 shows a modification in which the discharge end of the nozzle 18 is positioned in the cylindrical part 17 of the nozzle 13 but still at a large distance from the discharge end of the nozzle 13, as compared with Fig. 1 where the end of nozzle 18 is positioned in the conical portion of the bore of the nozzle 13. The nozzles 18 in both embodiments (Figs. 1, 2) terminate at a distance from the beginning of the narrowest cross section of nozzle 13.

Fig. 3 shows a part of a nozzle 18 through which two leads 11a and 11b, or the material for forming these leads, may simultaneously be fed into the sheathing nozzle 13 to be covered by the sheathing material 16. The two leads may be differently colored, or one may be hard and the other soft, etc.

Fig. 4 shows a section of a completed pencil having two leads 11a and 11b.

Fig. 5 shows a similar section of a pencil with three different leads 11a, 11b and 11c.

Fig. 6 shows how the lead 11 can be coated in the tube 21 with an adhesive 58 for more securely binding the sheathing to the lead. Here the adhesive 58 is fed through the tube 59 by means of apparatus not shown and through a nozzle 60 which corresponds in principle to the previously described nozzle arrangement for feeding the sheathing material over the lead. Here the nozzle 59 is threaded into a hole in the side of the tube 21.

Fig. 7 shows a section through an apparatus for making a pencil where both the marking material and the

sheath are thermoplastics. Here two feed screws are provided, arranged concentrically to one another, the inner one 33 serving for feeding the thermoplastic marking material 34 which is formed in the nozzle 18 into the lead of the pencil. The screw 33 operates in nozzle 18. This nozzle has a sleeve 36 surrounding it and welded to the nozzle 18 at its lower end. The outer screw 23 serves for feeding the sheathing material 16 and operates in the nozzle 13 which is mounted in a sleeve 37. The arrangement of the nozzle 18 in the nozzle 13 is in principle the same as in Fig. 1. Between the sleeve 36 and nozzle 18 is a channel 35 for the temperature controlling medium. Between nozzle 13 and sleeve 37 is a channel 25 also for the coolant or temperature-controlling medium. 26 and 27 denote, as before, the inlet and outlet, respectively, for channel 25. The bore of nozzle 18 is shaped to receive feed screw 33 and tapers gradually to the desired diameter of the finished pencil lead, the final portion of the bore of the nozzle, adjacent its discharge end, being preferably made cylindrical to properly form and hold the marking core, or lead 11. The bore of nozzle 13 in Fig. 7 is shaped similarly to the bore of nozzle 13 shown in Fig. 1 so that the thermoplastic sheathing material 16 flows smoothly over the nozzle 18 and joins the lead 11 emerging from nozzle 18 smoothly without undue pressure. The nozzle 18 is screwed at 40 into the lower end of a channelled sleeve 36 that contains the feed screw 33.

Pressure regulating and discharge tubes provided with bores 39 are mounted in sleeve 37. These serve to control the pressure of the sheathing material in the zone of juncture of the core 11 and the sheathing material 16. The pressure nipples 38 can for this purpose be interchanged with nipples of smaller or larger bore. The pressure regulating and pressure escape fittings 38 are provided with valves 62. The valves 62 are held closed under the pressure of springs 41 and can either be adjusted by changing the springs 41 or through threading of the caps 61 inwardly or outwardly. Excess sheath material can escape through valves 62 if the pressure in the material exceeds an adjusted limit, so that the pressure is regulated accordingly.

Fig. 7 also shows means for applying a plastic coating material 46 over the sheath 12 after the pencil has been formed. The thermoplastic coating material is fed over sheath 12 by a feed screw 44 which operates in a sleeve 45. This sleeve is provided with a channel 43 for a temperature-controlling medium. The duct through which the temperature controlling medium is carried is indicated at 49. The feed screw 44 serves to feed the thermoplastic outer covering material 46 through a hole in the lower end of nozzle 13 around the discharge end of nozzle 13 and into a nozzle 56. To insure smooth juncture of the coating material with sheath 12, the cylindrical part 17 of the nozzle 13 has a very narrow wall thickness adjacent its discharge end as is indicated at 47. The nozzle 17 ends at a distance from the smallest transverse section of the outer nozzle 56. The transverse section of the cylindrical part of the outer nozzle corresponds very closely in diameter to that of the transverse section of the pencil. The outer nozzle 56 is secured by means of screws 57 to the body 37. Pressure regulating fittings 38 are secured in sleeve 37 and nozzle 56. In this embodiment of the invention the channel for the coolant or temperature-control medium extends into nozzle 56 as well as through sleeve 37.

Figure 8 shows another arrangement in which the feed screw 33 for the thermoplastic marking material 34 is positioned so that the marking material 34 is fed from the side through a sleeve 36, an adaptor 52, and the curved portion 53 of a nozzle 18. The feed screw 33 rotates in the sleeve 36. The curved section 53 of nozzle 18 has a streamlined reinforcing projection 50 on its backside which also makes it possible for the sheathing material 16 to readily slide thereon. The

curved section 53 of the nozzle 18 is illustrated in Fig. 9. It comprises a ring 54 which is connected by integral spokes 55 with part 53 and which is set into a suitable recess in the sleeve 37. The temperature-controlling medium for the sleeve 36 is fed into a channel 35 in that sleeve through a duct 51.

The thermoplastic sheathing material is fed, as before, by a rotary feed screw 23 driven by conventional means. Sleeve 37 has a conical bore in its upper portion which tapers to the desired outside diameter of the pencil and then becomes cylindrical. The discharge end of nozzle 18 is situated some distance above the cylindrical section of the bore of sleeve 37 so that the thermoplastic sheathing material may glide smoothly over the tapered outside surface of nozzle 18 and smoothly join and cover the marking material 11 emerging from nozzle 18.

A thermoplastic coating material 46 is applied over the sheathed pencil. This coating material is supplied through a sleeve 45 which is mounted in sleeve 37 at right angles thereto. A feed screw 44 rotates in sleeve 45 to forward the hot thermoplastic coating material through the sleeve into a nozzle 56 that is secured in sleeve 37 (nozzle 13). Sleeve 37 (nozzle 13) as before, has a conical portion which receives the coating material and which merges with a conical bore in nozzle 56. The conical section of the bore of nozzle 56 merges into a cylindrical bore section of that sleeve at a point spaced far enough from the discharge end of nozzle 56 to form the coating closely around sheath 12 of the pencil and to adhere the coating firmly to the sheath so that the coated pencil emerges from the discharge end of nozzle 56.

Sleeve 45 is provided, as before, with a channel 43 for a coolant or temperature-controlling medium. This is supplied through port 49. Sleeve 37 is provided, as before, with a channel 25 for a coolant or temperature-controlling medium which is supplied through a duct 26.

The method of operation of the apparatus in the case of rigid leads 11 will be obvious from the preceding description but may be briefly summed up here, reference being had to Figs. 1 to 6 inclusive. Out of a magazine which is not shown, the leads 11 are fed through the sleeve or tube 21 into the nozzle 18 by means of conventional feed apparatus (not shown). The hot thermoplastic sheathing material 16 is fed in a plastic state by the feed screw 23 into the body 15. The sheathing material 16 is so fed in the body and the nozzle 18 is so arranged that the sheathing material slides for a sufficient length over the whole periphery of the thin-walled nozzle 18 so that the sheathing material 16 and the lead 11 move in the same direction and with the same speed in the direction of the narrowest section of the outer nozzle 13, and the sheathing material 16 slides from the thin-walled nozzle 18 onto the lead 11. Since both lead and sheathing material are moving in the same direction and the difference between the diameter of the lead and the inner transverse section of the sheathing material is very slight and since the sheathing material is deposited on the lead at a distance from the beginning of the narrowest section of the sheathing nozzle 13, the sheathing material is deposited securely on and about the lead without change of the inner transverse section and direction of the sheathing material and without essential pressure transmission and without injury to the lead. The bore of the cylindrical part of the nozzle 13 conforms to the desired outside shape and diameter of the pencil. Hence, the sheath 12 is firmly and smoothly secured to lead 11 and the finished pencil emerges from the nozzle 13.

Where it is desirable to employ an adhesive to secure the sheathing material firmly to the lead, an arrangement, such as shown in Fig. 6 may be employed. Here, the adhesive is carried through a tube 59 and through a nozzle arrangement 60 which corresponds in principle to the previously-described nozzle arrangement for sheathing rigid leads with sheathing material.

When the lead is produced from a thermoplastic marking material the operation is in principle the same. The marking material 34 (Figs. 7, 8) is, for example, fed by means of the rotary feed screw 33, which operates in the sleeve 36, into the nozzle 18 and is formed in this nozzle into the marking core 11. The sheathing material 16 is advanced by the feed screw 23. The nozzle 18 is so arranged that the sheathing material slides a sufficient distance on the whole periphery of the nozzle 18 and that its inside is pre-formed to the transverse section of the lead. The further operation corresponds completely to that described for rigid leads.

Should it be desired to provide the finished pencil in the same working operation with an outer covering then the coating material which is formable by heat and pressure is fed by means of a rotary feed screw 44 (Figs. 7 and 8) which operates in a sleeve 45. Since at the instant of introduction of the outer coating onto sheath 12, the pencil is still in a plastic easily formable state, the nozzle arrangement for the plastic coating corresponds completely to the previously-described nozzle arrangement for forming the sheath over the lead. The cylindrical part 17 of the nozzle 13 has on this account a very small wall thickness 47 for a sufficient length for the smooth union of the pencil with the outer covering. The material of the outer covering 46 is formed in its movement onto the sheathed pencil. Since the union of the outer covering 48 and of the pencil is at a sufficient distance from the narrowest portion of the nozzle 56, which gives the outer covering its outer form, the juncture and the deposit of the outer covering material takes place on the pencil without substantial transmission of pressure in a direction perpendicular to the pencil axis.

While the invention has been described in connection with several different embodiments thereof it will be understood that it is capable of further modification, and this application is intended to cover any variations, uses, or adaptations of the invention following, in general, the principles of the invention and including such departures from the present disclosure as come within known or customary practice in the art to which the invention pertains and as may be applied to the essential features hereinbefore set forth and as fall within the scope of the invention or the limits of the appended claims.

Having thus described my invention, what I claim is:

1. The method of manufacturing pencils by continuous extrusion of material through coaxial nozzles, which comprises continuously forwarding a marking-core medium in one and the same direction through a thin-walled elongated and straight tube forming part of the inner nozzle and having over most of its length adjacent to its outlet a constant cross section nearly equal to that of the pencil core; continuously feeding and forwarding through the outer nozzle a thermoplastic sheath material in heated and plasticized condition along the forwarding direction of the marking medium around the tube and pre-shaping the sheath material in symmetrical relation to the tube along said length of the tube thus forming in the pre-shaped sheath material a hole of the same cross section as the core medium; glidingly depositing the sheath material onto and around the core medium along an axially elongated zone confined within the outer nozzle, maintaining the radial component of pressure in the sheath material smaller than the axial component of pressure during the entire passage of the sheath material from along the tube to the outer-nozzle outlet, and maintaining the sheath material confined to a constant cross section along an elongated path adjacent to the outer-nozzle outlet to externally shape the sheath to its final shape, whereby the continuously extruded core and sheath in the finished pencil are intimately joined with each other.

2. The method of manufacturing pencils by continuous extrusion of material through coaxial nozzles, which comprises continuously extruding a thermoplastic mark-

ing-core material in one and the same direction and in heated and plasticized condition through a thin-walled, elongated and straight nozzle tube forming the outlet part of the inner nozzle to obtain a marking core of final shape where the core material emerges from the outlet of the tube; continuously forwarding through the outer nozzle a thermoplastic sheath material in heated and plasticized condition along the forwarding direction of the core material around the tube and pre-shaping the sheath material in symmetrical relation to most of the length of the tube adjacent to its outlet thus forming in the sheath material a hole of substantially the same cross section as the core material; glidingly depositing the sheath material on and around the core material along an axially elongated zone confined within the outer nozzle, maintaining the radial component of pressure in said sheath material smaller than the axial component of pressure during the entire passage of the sheath material from along the tube to the outer-nozzle outlet, and maintaining the sheath material confined to a constant cross section along an elongated path adjacent to said outer-nozzle outlet to externally shape the pencil to its final shape, whereby the core material and sheath material in the finished pencil are intimately bonded to each other.

3. In the method of manufacturing pencils according to claim 1, the steps of composing the marking-core medium of a plurality of differently colored rigid parts, and simultaneously feeding said core parts axially beside each other through the inner-nozzle tube, whereby a plural-color pencil is produced.

4. The method of manufacturing pencils by an extrusion screw press having coaxial inner and outer nozzles respectively, which comprises feeding a rigid marking-core material in one and the same direction through a thin-walled, elongated and straight nozzle tube forming part of said inner nozzle, and coating said core material with an adhesive as the core material is moving into said nozzle tube; continuously feeding and forwarding through the outer nozzle a thermoplastic sheath material in heated and plasticized condition along the forwarding direction of the core material around the tube and pre-shaping the sheath material in symmetrical relation to the tube along most of the length of said tube adjacent to its outlet thus forming in the sheath material a hole of substantially the same cross section as the adhesively coated core material; glidingly depositing the sheath material onto and around the adhesively coated core material at the point where both materials meet, maintaining the radial component of pressure in the sheath material smaller than the axial component of pressure during the entire passage of the sheath material from along the tube to the outer-nozzle outlet, and maintaining the sheath material confined to a constant cross section along an elongated path adjacent to the outer-nozzle outlet to externally shape the sheath to its final shape, whereby the core material and sheath material in the finished pencil are intimately joined with each other by said adhesive.

5. The method according to claim 1, which comprises flowing a thermoplastic coating material in heated and plasticized condition and in film thickness onto and around the sheath material while the sheath material in heated condition passes out of said path of confined cross section, confining the coated material along an elongated additional path to a constant cross section corresponding to that of the finished pencil, and maintaining the radial component of pressure in the coating material smaller than the axial component of pressure during the entire passage of the coating material from the point where it meets the sheath material to the end of said additional path.

6. Apparatus for manufacturing pencils by continuous extrusion comprising, in combination, an outer nozzle having a bore, an inner nozzle having an outlet and having adjacent to said outlet and within said bore a

straight elongated and thin-walled tube of uniform cross section corresponding nearly to that of the finished marking core; means for continuously supplying marking medium through said inner nozzle to emerge from said tube outlet; means for continuously forwarding thermoplastic sheath material through said outer nozzle; said inner-nozzle tube having over most of its length within said outer-nozzle bore a wall thickness which is a fraction of the inner width of the tube and which tapers at said outlet to a line edge having the shape and size of the core of the finished pencil; said outer-nozzle bore extending coaxially and symmetrically around said tube over most of said tube length and extending axially beyond said inner-nozzle outlet, said bore having a portion tapering toward the outer-nozzle outlet and having a straight elongated portion adjacent to the outer-nozzle outlet and of constant cross section corresponding to that of the finished sheath, said tapering portion of said outer-nozzle bore extending coaxially and symmetrically to said inner-nozzle tube at a location along said tube, said tube outlet being axially spaced from the narrowest cross section of said tapering portion of said outer-nozzle bore, and said bore having between its portion of constant cross section and said tube outlet a maximum taper smaller in the diametrical direction and longer in the axial direction than the diameter of said constant cross section.

7. In apparatus for manufacturing pencils according to claim 6, said outlet of said inner-nozzle tube being located within said outer-nozzle bore portion of constant cross section, and said latter bore portion having most of its axial length extend beyond said tube outlet.

8. In apparatus for manufacturing pencils according to claim 6, said marking-medium supply means comprising an inner feed screw coaxially located within said feed-screw means for said sheath material, a stationary sleeve disposed coaxially between said feed-screw means and said inner feed screw and coaxially joined with said inner nozzle, said sleeve having channel means extending along said inner feed screw for heat-control medium; and a sleeve coaxially enclosing said outer nozzle and having fluid-channel means constituting said temperature control means.

9. In apparatus for manufacturing pencils according to claim 6, said core-material feed means comprising an inlet member having a duct coaxially aligned with the interior

of said nozzle tube for supplying said marking medium in form of a pre-shaped rigid core body; further nozzle means having a cavity surrounding said duct in said inlet member, and further feed means communicating with said cavity for supplying adhesive thereto, whereby said core body is adhesively coated when entering said nozzle tube.

10. In apparatus for manufacturing pencils according to claim 6, said outer nozzle having lateral openings extending from said tapering portion of said outer-nozzle bore to the outside, and respective adjustable pressure relief valves normally closing said openings to permit escape of sheath material when the pressure in said sheath material within said bore reaches an adjusted value.

11. In an apparatus according to claim 6, said outer nozzle having a tubular wall tapering toward the outer-nozzle outlet to a line edge having the shape and size of the sheath of the pencil; and a coating nozzle coaxial with said other two nozzles and surrounding said tubular wall and line edge of said outer nozzle, continuous feed means connected with said coating nozzle for supplying thermoplastic coating material thereto; said coating nozzle having a straight outlet portion of constant inner cross section corresponding to that of the finished pencil and having another portion adjacent to said outlet portion and tapering toward said outlet portion, the outlet of said outer nozzle being axially spaced from the narrowest cross section of said tapering portion of said coating nozzle.

12. In apparatus according to claim 11, said coating nozzle having a lateral opening extending from said tapering portion of said coating nozzle to the outside, and a pressure relief valve normally closing said opening to permit escape of coating material when the pressure in said outlet portion exceeds a given value.

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