

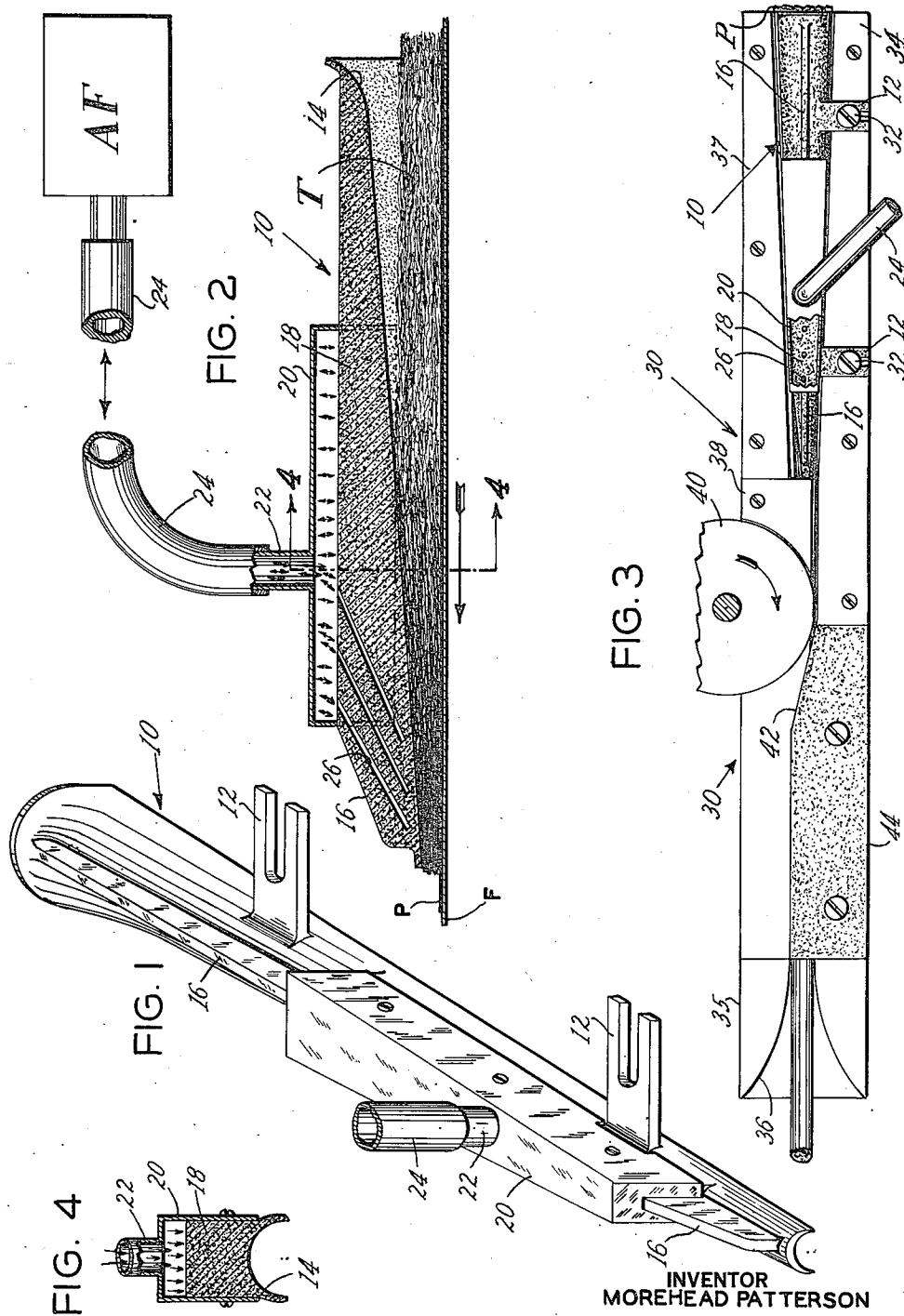
Nov. 11, 1952

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2,617,426

ROD FORMER TONGUE

Filed Dec. 2, 1944



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2,617,426

ROD FORMER TONGUE

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Application December 2, 1944, Serial No. 566,342

13 Claims. (Cl. 131-66)

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This invention relates to cigarette machines, more particularly to the rod former thereof wherein a continuous layer of tobacco advanced on a web of cigarette paper is compacted to a predetermined diameter and the cigarette paper is folded about the compacted tobacco layer to form a cigarette rod. For this purpose the rod former is provided with a tongue having a tapering channel through which the tobacco is advanced on the paper web and thus compacted to the desired diameter. After emerging from the tongue one edge of the paper is folded over upon the compacted tobacco by a so-called paster section block and a suitable adhesive is applied to inner face of the other edge of the paper. Then the pasted edge of the paper is overlapped upon the previously folded edge of the paper to form the seam of the cigarette rod which is finished by a sealer mechanism immediately prior to severance of cigarettes from the cigarette rod.

One of the main objects of my invention is to relieve the friction of the tobacco passing through the tongue which is great enough to cause momentary "chokes" or interruptions of the movement of the tobacco through the tongue and thus impair the uniformity of the compacted tobacco. To this end the tongue may be formed of sintered metal powder which may be pressed or machined to the required shape. Thus the porous nature of the tongue will permit the air which is entrapped by the passage of the tobacco through the channel to escape and thereby facilitate the passage of the tobacco through the channel. Moreover compressed air may be forced through the pores of the tongue to relieve the pressure of the tongue on the tobacco. If desired, the tongue may be impregnated with a bland lubricant to reduce the friction of the tobacco passing through the tongue, or dust and fine particles may be withdrawn through the pores of the tongue by use of suction. The use of a tongue formed of sintered metal powder has a further advantage in that the channel through which the tobacco passes has a rough surface which tends to reduce the formation of "chokes" and thus avoid the non-uniform sections of the cigarette rod created by "chokes."

A further object of the invention is to provide the rod former with one or more folder sections formed of sintered metal powder. The use of a folder section or block formed of porous metal powder has advantages similar to those obtained with the porous metal tongue. Similar advantages may also be obtained by construction of the bottom block, which is provided with a channel

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through which the paper advances the tobacco underneath the tongue and between the folder blocks of porous metal.

In the accompanying drawings which form a part of this specification and in which like characters of reference indicate the same or like parts:

Fig. 1 is a perspective view of a cigarette machine tongue exemplifying the invention;

Fig. 2 is a sectional view of the tongue illustrating its operation while compacting the tobacco on the cigarette paper advanced by the rod-forming tape;

Fig. 3 is a plan view of the rod former of a cigarette machine, the rod former being equipped with the porous metal tongue shown in Fig. 1 and the lap folder block also being formed of porous metal; and

Fig. 4 is a cross-section of the tongue taken on the line 4-4 of Fig. 2.

Referring to the drawings, it will be seen that the cigarette machine tongue 10 may be formed of sintered or hot pressed metal powder which is compressed to the finished form shown in the drawings, or the tongue may be machined to the required shape after the metal powder has been compressed and sintered. Further description of how the tongue is formed from metal powder is deemed unnecessary, and reference may be had to Patents 2,267,918 and 2,226,520 wherein the manufacture of porous metal is described. This material is manufactured under the trade name "Porex" by the Moraine Products Division of the General Motors Corporation. The tongue 10 is slightly narrower than the cigarette paper web P at one end, as shown in Fig. 3, and gradually tapers off to approximately the diameter of the cigarette rod at its other end. A pair of forked lugs 12 may be formed integrally with the tongue, and these lugs may be fastened to the rod former in a manner hereinafter described, to support the tongue in the position shown in Figs. 2 and 3, to compact the tobacco advanced on the cigarette paper web P by the rod-forming tape F.

As shown in Figs. 2 and 4, the tongue 10 is provided with a tapered channel 14 on its bottom through which is advanced the continuous layer of tobacco T after being showered on the cigarette paper P by a tobacco feed (not shown). The cigarette paper P is advanced by the endless rod-forming tape F which is driven by a tape wheel of any suitable type such as shown in the patent to C. Arelt 2,208,504. The tape F has a run shown in Fig. 2 which extends through the rod former and travels in the proper direction indicated by the arrow in Fig. 2 to advance the tobacco T

through the channel 14 of tongue 10. Channel 14 is gradually tapered from its inlet end to its outlet end where its curvature may conform to the desired diameter of the cigarette rod. While tobacco T is advanced through channel 14 it is gradually compacted, so that on emerging from the tongue it has the desired diameter. However, the compaction of the tobacco by the tongue produces considerable stress on the tongue, particularly at its outlet end which is considerably thinner than other portions thereof. Therefore an integral rib 16 is provided on the top of the tongue. Rib 16 may extend from the inlet end of the tongue to the outlet end thereof. At an intermediate section 18 the thickness of rib 16 may be greater than at its ends, and an air chamber 20 may be fastened to the section 18. Chamber 20 is provided with slots in its ends, as shown in Fig. 1, which fit tightly on portions of rib 16 adjacent the ends of section 18. Chamber 20 is provided with a nipple 22 connected by a hose 24 to a source of compressed air or suction, as indicated by the double-headed arrow in Fig. 2.

When the compressed air is introduced into chamber 20 from a suitable air flow source such as box AF it will pass through the pores of the tongue into channel 14 and create a slight air pressure on the surface of the tobacco engaging the channel. In this manner, the friction created by the compaction of the tobacco passing through the channel, may be greatly reduced. Moreover the rough surface of channel 14, which is characteristic of porous powdered metal products, tends to prevent the formation of "chokes" or momentary interruptions of the movement of the tobacco through the channel and thus avoid the formation of non-uniform sections in the cigarette rod.

Since the friction resulting from the compaction of the tobacco will be greatest at the outlet end of the tongue, and this portion of the tongue is most remote from air chamber 20, it is desirable to provide ducts 26 extending from the top of section 18 of the rib diagonally thereof to points adjacent the outlet end of the channel. Accordingly, the compressed air from chamber 20 will fill ducts 26 and pass through the portions of the tongue adjacent their inner ends into the channel 14 and create air pressure against the underlying surface of the tobacco and thereby reduce the friction of the tobacco at the outlet end of the channel.

When the tongue 10 is installed on the rod former 30 its lugs 12 are secured by screws 32 to a block 34 fastened to a bottom block 35 extending throughout the length of the rod former and provided with a channel 36 of U-shaped cross-section extending throughout the length of the block 35. Channel 36 tapers gradually from its inlet end underneath tongue 10 to a point intermediate the length of the rod former to provide a converging passage effecting the shaping of the tobacco T on paper P, as they are advanced on tape F, to form a cylindrical tobacco filler rod. The block 34 is secured at one side of channel 36 and block 37 is secured at the other side of the channel, the inner edges of blocks 34 and 37 being tapered in conformity with the convergence of the adjoining portion of channel 36.

The edges of the paper web P pass between the sides of tongue 10 and the inner edges of blocks 34 and 37, and then one of the edges of the paper passes underneath a paster section block 38 which is fastened to the bottom block

35 and hollowed along its inner edge to fold one edge of the paper over the tobacco layer T which is now of cylindrical shape approximating the desired size of the cigarette rod. The other edge of the paper passes vertically into the slot between the block 34 and block 38, and paste is applied to this upstanding edge by a paste wheel 40, the upper face of block 38 being cut away to accommodate the paste wheel. The pasted edge of the paper P is then folded upon the other edge of the cigarette paper by the beveled portion 42 of the inner edge of block 44 which is fastened to bottom block 35. The overlapped edges of the cigarette paper are held together as they pass under the remainder of the inner edge of block 44, and the cigarette rod so formed then passes out through the flared portion of the channel 36 in the portion of the bottom block shown projecting beyond the blocks 30 and 44 in Fig. 3. Beyond the flared end of channel 36 the overlapped edges of the paper P are engaged by a heated sealer (not shown) and the cigarette rod is thus finished. After leaving the sealer the cigarettes are severed from the cigarette rod by a cutoff (not shown).

If desired, the pores of tongue 10 may be filled with a bland lubricant, such as mineral oil, to reduce the friction of the tobacco passing through channel 14. Moreover, if desired, the chamber 20 may be connected to a suitable source of suction, such as air flow box AF, to create suction on the face of the tobacco T engaging the channel and thereby remove dust and fine particles and entrapped air through the pores of the tongue.

Like the tongue 10, the block 44 may be formed of powdered metal which has been compressed and sintered to form a porous mass. Moreover, the bottom block 35 or the paster section block 38 may be similarly formed of porous metal. In the case of the tongue it will be possible for any air that may be entrapped by the passage of tobacco T through channel 14 to escape through the pores of the tongue. A similar effect may result with the passage of the cigarette rod under block 44 and should it be desirable to produce a slight pressure on the seam formed by the overlapped edges of the cigarette paper an air chamber similar to chamber 20 may be installed on block 44 and connected to a source of compressed air. Thus the compressed air will permeate block 44 and create a slight pressure on the seam which will help to set it.

The terms and expressions which I have employed are used as terms of description and not of limitation, and I have no intention, in the use of such terms and expressions, of excluding any equivalents of the features shown and described or portions thereof, but recognize that various modifications are possible within the scope of the invention claimed.

What is claimed is:

1. In a cigarette rod former, a horizontal porous powdered metal tongue having a tapering channel arranged to admit a layer of tobacco advanced horizontally on a traveling web of cigarette paper and thus compact said layer to a predetermined shape, and a device for moving air through the pores of said tongue to the surface of the tongue adjoining the tobacco to reduce the friction of the tobacco passing through the tongue.

2. In a cigarette rod former, a porous powdered metal tongue having a tapering channel arranged to admit a layer of tobacco advanced on a travel-

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ing web of cigarette paper and thus compact said layer to a predetermined shape, and a device for withdrawing air from said channel through the pores of said tongue to remove dust from said tobacco layer.

3. In a cigarette rod former, a porous powdered metal tongue having a tapering channel arranged to admit a layer of tobacco advanced on a traveling web of cigarette paper and thus compact said layer to a predetermined shape, and a device for blowing air through the pores of said tongue adjacent the smaller end of said channel.

4. In a cigarette rod former, a porous powdered metal tongue having a tapering channel arranged to admit a layer of tobacco advanced on a traveling web of cigarette paper and thus compact said layer to a predetermined shape, said tongue being provided on its top with a rib extending above the smaller end of the channel for strengthening the tongue, and said rib being provided with long clearly definable ports extending downwardly through the rib only and at only the smaller end of said channel, and a device for blowing air through said ports and through said tongue into said channel to reduce the friction of the tobacco on the smaller end of said tongue.

5. A cigarette machine tongue formed of metal powder particles which have been bonded together to form a porous mass having pores permeable to air, said tongue having a uniformly tapered channel adapted to compact a traveling stream of tobacco, said channel having a rough surface adapted to engage the tobacco passing through the channel, and means connected to the tongue for creating a flow of fluid through the pores of said tongue to reduce the friction of the tobacco passing through the channel.

6. A cigarette machine tongue formed of metal powder particles bonded together to form a porous mass and having a tapered channel through which tobacco is advanced, said tongue having a chamber mounted thereon and adapted to admit compressed air and means connected to the chamber for creating a compressed air condition within the chamber which will be forced through the pores of said tongue into said channel to reduce the friction of the tobacco passing through said channel.

7. A cigarette machine tongue formed of metal powder particles bonded together to form a porous mass and having a channel through which tobacco is advanced, said tongue being provided with rectilinear ports extending only partially through the tongue into the proximity of said channel and adapted to conduct compressed air which will be forced from the inner ends of the ports through an adjacent portion of the tongue to the exterior surface thereof into said channel, and means on the tongue for supplying compressed air to the ports.

8. In a cigarette rod former, the combination with a tongue formed of porous powdered metal and having a tapering channel arranged to admit a layer of tobacco advanced on a traveling web of cigarette paper and thus compact the tobacco layer to a predetermined shape, said tongue being provided with long clearly defined openings extending partially through said tongue to the proximity of said channel adjacent the smaller end of the channel, and means for forcing air through the openings of the tongue and the portion of the tongue between the inner end of said openings and said channel to reduce the friction of the tobacco passing through said channel.

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9. In a cigarette rod former, the combination with a horizontal member having a recess in its top which has a tapered section adapted to guide a traveling rod-forming tape supporting a cigarette paper web carrying a continuous layer of shredded tobacco; of a tongue formed of metal powder particles which have been bonded together to form a porous mass and having a tapered channel in its bottom and coacting with the tapered section of the recess in said member to compact said tobacco layer to a circular cross-section as it is carried into the larger end of said channel and out the smaller end thereof by the cigarette paper web, said tongue being relatively thinner adjacent the smaller end of said channel than at the remainder thereof and provided on its top with a rib extending above the portion thereof adjacent the smaller end of the channel for strengthening the tongue, and said rib being provided with passageways extending downwardly and partially through the rib into the proximity of the smaller end of said channel; flowable material housing means mounted on the top of said tongue for creating a circulation of said material and communicating with said passageways for creating a circulation of air through said ducts and an adjacent portion of the tongue, and means connected to said housing for causing movement of said material.

10. A cigarette machine tongue formed of metal powder particles which have been bonded together to form a porous mass and having a tapered channel in its bottom adapted to compact a continuous shredded tobacco layer as it is carried into the larger end of said channel and out the smaller end thereof, said tongue being relatively thinner adjacent the smaller end of said channel than at the remainder thereof and provided on its top with a rib extending above the portion thereof adjacent the smaller end of the channel for strengthening the tongue, and said rib being provided with rectilinear passageways extending downwardly through the rib and terminating adjacent the smaller end of said channel, said end of the channel being porous, and means connected to the tongue for creating a flow of fluid therethrough, said porous mass providing a continuation of said passageways to an exposed surface of the channel.

11. In a cigarette rod former, the combination with a porous powdered metal rod forming member having pores permeable to air and having a channel arranged to admit a stream of tobacco advanced on a traveling web of cigarette paper and form said stream into rod shape, and means connected to the rod forming member for creating a flow of fluid through the pores of said member to reduce the friction of the rod passing through said member.

12. In a cigarette rod former, the combination with a porous powdered metal tongue having a tapering channel adapted to admit a layer of tobacco advanced on a traveling web of cigarette paper and thus compact the tobacco layer to a predetermined shape, said tongue being provided with communicating passages from the upper surface and partially through said tongue into the proximity of said channel adjacent the smaller end thereof, and a device secured to the upper surface of the tongue for withdrawing air from said channel through the openings of said tongue to remove dust from said tobacco layer.

13. In a cigarette rod former, the combination with a member having a channel provided with a tapered section adapted to support a traveling

rod-forming tape advancing a cigarette paper web carrying a continuous layer of tobacco, of a tongue formed of porous powdered metal having pores permeable to air and having a tapered channel overlying the tapered section of the channel in said member and coacting with said tapered channel section to compact the tobacco layer to a circular cross-section, the channel in said tongue having a rough face engaging the tobacco, and means connected to the tongue for creating the flow of fluid through the pores of said tongue to reduce the friction of the tobacco passing through the tongue.

MOREHEAD PATTERSON.

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