Apparatus for the production of a cartridge of smoking tobacco for a smoking pipe, the apparatus consisting of a mold member defining a cylindrical chamber with a cylindrical plunger adapted for insertion therein for compression of cut pieces of tobacco, each of the members having a central axial opening for receiving and supporting the ends of a core piece while tobacco is pressed in the mold member around the core piece.

3 Claims, 7 Drawing Figures
SMOKING PIPE CARTRIDGE PRODUCTION APPARATUS

The present invention relates to an improved cartridge of precompressed pipe tobacco which is adapted for quick and easy insertion into a smoking pipe.

In the usual method of pipe smoking, the smoker uses his fingers to stuff and compress loose pipe tobacco into the pipe bowl. This can be a messy procedure since it often leads to spilled tobacco and a consequent loss of tobacco. Furthermore, if the tobacco is packed too tightly, it does not “draw” well and takes an uncomfortable amount of suction by the smoker to light it and to maintain it in the lighted condition. On the other hand, if the tobacco is packed too loosely, the burning tends to proceed too rapidly to the bottom of the bowl, providing a smoke which is too short and hot, and leaving unburned tobacco along the sides of the bowl. Restamping of the partially burned charge then causes burnt fingertips and possible hot ash spills.

Another disadvantage of the present system of hand tamping of loose tobacco into the pipe is that the tobacco in the very bottom of the bowl is exposed to a possible back flow of saliva from the mouth of the smoker which forms a hard saliva soaked cake which does not burn and which makes cleaning of the pipe difficult. Still another problem encountered with the normal method of loading a pipe is that the proper loading of the pipe takes a considerable period of time during which one or both hands of the smoker are completely occupied with the pipe loading task. This makes it difficult to combine loading of the pipe with other common activities such as driving an automobile.

Accordingly, it is one of the objects of the present invention to provide a cartridge of pipe tobacco which has substantially the right degree of compression and which is easily, quickly, and conveniently inserted into the pipe bowl by the smoker.

It is another object of the invention to provide a cartridge of pipe tobacco which is shaped so as to avoid the saliva soaked and unburnable heel of tobacco in the bottom of the pipe, thus avoiding the consequent waste of tobacco and difficulty in cleaning of the pipe.

In fabricating a cartridge of tobacco for a smoking pipe, it is a problem to control, within sufficiently narrow limits, exactly how much compression to use to avoid having the cartridge become too dense and impervious to air for easy draw. Furthermore, there is a definite upper limit to the amount of tobacco which can be incorporated into the cartridge and to the amount of pressure which can be employed in forming the cartridge because of the necessity for maintaining sufficient porosity to permit easy draw.

Prior attempts at producing a preformed cartridge of pipe tobacco have involved strong measures to get the particles of tobacco forming the cartridge to hold together. In some instances, non-removable wrappers have been employed, and in other instances adhesive binding materials have been added to the tobacco to cause the particles to stick together. However, it has been one of the disclosures of the present invention that normal pipe mixtures will hold together and will form a cohesive cartridge without permanent wrappers and without added adhesive materials provided sufficient pressure is employed in the formation of the cartridge. However, it has been discovered that if a high pressure is used, ease of draw is substantially impaired.

Accordingly, it is one of the objects of the present invention to provide an improved cartridge having provisions for forming the central opening just before use by the smoker.

It is another object of the invention to provide an apparatus which is especially adapted for production of a cartridge of pipe tobacco as described above.

Other objects and advantages of the invention will be apparent from the following description and the accompanying drawings.

In carrying out the invention there is provided a cartridge for a smoking pipe comprising a quantity of cut pieces of tobacco compressed into a cohesive cylindrical body having substantially flat ends, and a removable core piece having a smooth non-adherent surface extending axially entirely through said cylindrical body and protruding for a substantial dimension beyond at least one axial end thereof.

In the accompanying drawings:

FIG. 1 is a sectional side view of a cartridge of pipe tobacco in accordance with the present invention.

FIG. 2 is a sectional side view illustrating the mode of insertion of the cartridge of FIG. 1 into a pipe.

FIG. 3 is a sectional side view illustrating the appearance of the cartridge of pipe tobacco after insertion into the pipe and in readiness for smoking.

FIG. 4 is a sectional side view illustrating the plunger member of an apparatus in accordance with the invention for the production of a cartridge such as that shown in FIG. 1.

FIG. 5 is a side view, partially in section, illustrating the mold member of an apparatus in accordance with the invention for the production of a cartridge such as that shown in FIG. 1.

FIG. 6 is a sectional side view illustrating the mode of operation of the apparatus including the plunger of FIG. 4 and the mold member of FIG. 5.

FIG. 7 is a sectional view of a funnel device which is usable for assisting in filling the mold member of FIG. 5.

Referring more particularly to FIG. 1, the cartridge consists preferably of a cylinder 10 of tightly compacted pipe tobacco having embedded in its center axial portion a core member 12. The entire cartridge 10, including the core 12, is preferably completely enclosed in a moisture-proof wrapper 14 which may be composed of a plastic film, or metal foil. The ends of the cylinder are preferably flat and square. This is particularly true of the lower end 13.
The core 12 is preferably composed of a material which is inexpensive, which will not absorb an appreciable amount of moisture from the tobacco of the body 10, and which is easily withdrawn from the tobacco body 10. The core 12 may preferably consist of a thin cylinder of cellulosic material such as paper. The paper core 12 is preferably impregnated, or at least coated on its outer surface, with a moisture-resistant plastic which also makes the outer surface smooth and slippery to promote ease of withdrawal of the core from the tobacco body 10. However, various alternatives are available, including forming the core 12 entirely of plastic.

The tobacco body 10 is preferably compacted at a considerable pressure which is preferably somewhat higher than the pressure normally attained by a smoker in loosely compacting tobacco into his pipe bowl. Thus, more tobacco is incorporated into the cylindrical body 10 of the cartridge 10 than would normally be expected considering the actual dimensions of the cartridge. The dimensions of the cartridge may be selected to fit the bowl of a typical smoking pipe. While the dimensions of pipe bowls vary somewhat in size, a cartridge dimension of about one inch in length, and five-eighths to three-quarters of an inch in diameter has been found to be quite satisfactory for a number of pipes.

FIG. 2 illustrates the cartridge 10 of FIG. 1 with the outer wrapper 14 removed and in the position in which insertion of the cartridge into a pipe 16 is commenced. As illustrated in FIG. 2, the inner walls of a pipe bowl, such as shown at 18 and 20 of pipe 16, are usually tapered slightly inwardly towards the bottom to provide a wedging action to promote the compaction of the tobacco in the bowl. With the cartridge of the present invention, the entire cartridge 10 is forcibly pushed towards the bottom of the bowl to a position as indicated in FIG. 3. The outer diameter of the cartridge 10 is selected so as to be slightly greater than the inside diameter of the bowl in the lower portions thereof. Thus, the cartridge is firmly wedged into the pipe bowl and the bottom portion of the cartridge is under substantial additional radial compression by reason of the wedging.

FIG. 3 illustrates the cartridge 10 after it is pressed into the pipe bowl to the proper level. After the cartridge is in this position, the upper end of the core member 12 is firmly grasped by the user and pulled upwardly and out of the cartridge 10, while at the same time placing pressure on the top of the upper cartridge surface to keep the cartridge snugly in the bowl. The removal of the core leaves a central passage 22 through the cartridge 10 which permits air to be drawn easily through the bowl and through the stem of the pipe by the smoker, despite the fact that the tobacco of the cartridge is compressed very tightly.

It has been observed that because the tobacco near the core of the cartridge body 10 remains under compression, as soon as the core 12 is removed, the tobacco tends to expand into the central core passage 22, thus tend to partially block off that passage. This effect is accentuated by the radial compression imposed by wedging the cartridge into the pipe bowl. It is recommended however that the user immediately light the pipe, and it has been found that if the pipe is lighted within a reasonably short period after removal of the core, the expansion of the tobacco into the central passage 22 is not so great as to seriously obstruct the passage. However, it is because of the tendency of the compacted tobacco to expand into the central passage 22 that it is regarded as essential that the core 12 remain in the cartridge while the cartridge is inserted into the pipe, and preferably until just before the pipe is lighted.

It has been found that by following this teaching of the present invention, it is possible to compact the tobacco in the cartridge 10 to a much greater degree than would otherwise be possible. This high degree of compaction has a number of advantages. For one, a larger amount of tobacco may be placed in the pipe in a single charge so that a longer smoke can be enjoyed without the necessity for continually refilling the pipe. Another advantage is that with a high compaction, it has been found that self cohesive cartridges can be assembled using standard pipe tobacco brands, without the necessity for the addition of special adhesive materials to keep the particles of tobacco together in a caked form.

For achieving the purposes of this invention, and the advantages enumerated above, it has been found that a minimum compaction pressure for obtaining reasonable cohesion of the tobacco particles with normal pipe tobacco moisture content is about 18 pounds per square inch exerted on the axial end of the cartridge. From a practical standpoint, no upper maximum limit of pressure has been determined up to the present time. However, a very satisfactory pressure has been found to be in the order of 20 pounds per square inch. With higher pressures, the tobacco tends to expand more into the central air passage after withdrawal of the core, reducing the "draw." Once the pipe is lighted, the actual burning of tobacco proceeds rather rapidly through the central air passage 22, tending to at least partially enlarge that passage so that the pipe draws very easily, even though the tobacco may be compressed very tightly. It has been found that the burning of the tobacco then proceeds rather evenly radially outwardly from the central passage 22 so that substantially all of the tobacco of the cartridge is ultimately consumed.

While it has been stated above that it has been discovered that it is possible to make cohesive cartridges in accordance with the present invention without the need for the addition of materials to promote adhesion and cohesion, it will be understood that it is not necessarily beyond the scope of this invention to form such cartridges with additions of material to promote cohesion and adhesion of the particles.

The cartridge 10 is preferably formed with flat, squared ends. Particularly the bottom end 13 of the cartridge is preferably flat and defines a plane which is perpendicular to the axis of the cartridge corresponding to the position of the core 12 and the resulting air passage 22. Thus, when the cartridge is wedged into the pipe bowl, as illustrated in FIG. 3, the bottom 13 of the tobacco of the cartridge 10 does not extend into the curved bottom of the bowl, leaving an empty chamfer 24 in the bottom of the bowl. This chamfer 24 occupies the position where the hard "heel" of tobacco is often formed with normal loading of the pipe. However, using the cartridge 10, the formation of the hardened tobacco heel is avoided, and substantially the entire tobacco cartridge is ultimately consumed by burning, affording full pleasure to the smoker without substantially waste of tobacco in an unburnable heel. Furthermore, substantially complete burning of the tobacco, substantially without heel formation, greatly
simplifies the subsequent cleaning of the pipe. Only the ashes of burned tobacco need be knocked from the pipe bowl for a virtually complete cleaning action.

The cartridge in accordance with the present invention may be formed in an apparatus as illustrated in FIGS. 4, 5, 6, and 7.

Referring particularly to FIG. 4, the plunger 26 may consist of a simple hollow cylindrical shell, and may be provided at its top with a plastic snap-on cover 28. The plunger preferably includes inner annular walls 30 defining an axial opening extending up through the bottom of the plunger and having a diameter to receive and support the core 12 of a cartridge which is being formed. The interior of the plunger 26 may be employed for the storage of fresh cores 12 and also wrapping sheets of moisture resistant materials such as metal foil. The interior is accessible by unsnapping the cover 28.

The mold illustrated in FIG. 5 consists basically of a hollow cylindrical body 34 which is open at the top and closed at the bottom. This body includes a raised mold floor indicated at 36 and having a central opening therein at 38 to receive and position the core member 12. The raised floor structure is also separated at its outside edge from the main inner surface of the mold body 34, leaving a circumferential slot, as indicated at 40, to admit the edges of a sheet of moisture-proof wrapping material while the cartridge is being formed.

A hinge 42 is provided on the side of the mold 34 to permit the mold to be opened for easy and simple removal of the finished and compressed cartridge. In order to permit release of the two halves of the mold 34 to swing apart on the hinge 42, a releasable pin 44 is provided on the other side of the mold. The pin 44 and the associated structural portions of the mold body 34 are very similar to the hinge 42 except that the pin 44 can be simply removed by drawing the pin upwardly. When the mold is to be used again, it is closed and the pin 44 is re-inserted.

FIG. 6 illustrates the method of use of the apparatus of FIGS. 4 and 5 in forming the cartridge of the present invention. First, the moisture-proof wrapper 14 is placed so that it lines the interior of the mold 34 in the position as illustrated in FIG. 6 with the lower edge of the wrapper extending down into the outer edge slot 40. The insertion of the wrapper can be accomplished very easily by wrapping it around the exterior cylindrical surface of the plunger 26 and inserting the plunger into the mold before any tobacco is loaded into the mold. The plunger is then withdrawn from the mold leaving the wrapper in place. Next, the core member 12 is inserted into the central opening 38 in the bottom of the mold 34. Next, the mold is substantially filled with loose pipe tobacco, as shown at 10A. The plunger is then inserted at the top of the mold, with the upper tip of the core 12 started into the central opening 32 of the plunger. The plunger is then forced downwardly as illustrated in FIG. 6, compressing the tobacco 10A to form the cartridge. It may be necessary to add more tobacco several times in order to build the cartridge up to the proper height at the desired degree of compression.

After the desired height of the cartridge is built up, the pin 44 is removed, the cartridge is removed from the mold 34, and the ends of the moisture-proof wrapper 14 are bent over and secured around the ends of the cartridge. Before closing the wrapper, the core 12 may be moved upwardly in the cartridge to the position illustrated in FIG. 1, so that it does not protrude through the bottom of the cartridge. It has been found desirable to do this in order to promote ease of wrapping the cartridge. Furthermore, if the core 12 is longer than necessary after such core movement, the upper tip of the core may be clipped off.

It is one of the features of the present invention that it has been discovered that various of the commercial pipe mixtures of tobacco may be compacted into cartridges which are so cohesive as to be self-sustaining in accordance with the present invention, without the need for the addition of any adhesion or cohesion enhancing agents. For instance, tobacco mixture brands sold under the following trademark names have been found to work satisfactorily in accordance with the teachings of this invention:

EDGEWORTH (a trademark of the House of Edgeworth, Richmond, Va.)
MADEIRA MIXTURE (a trademark of the R. J. Reynolds Tobacco Company)
PRINCE ALBERT (a trademark of the R. J. Reynolds Tobacco Company).

In order to provide greater ease in filling the mold 5 with sufficient tobacco to form an acceptable cartridge after the prescribed amount of compression, both the mold 34 and the plunger 26 may be increased in vertical dimension, thus providing a larger initial volume within the mold. Alternatively, the tobacco may be hand tamped into the mold to obtain a reasonable degree of compression before the plunger is inserted into the mold. In order to make filling more convenient, a funnel device as illustrated in FIG. 7 is preferably provided.

FIG. 7 illustrates a funnel device 46 which is flared outwardly at the top, and which has a minimum inner diameter at 48 generally corresponding to the inner diameter of the mold 34, which is shown in dotted outline in FIG. 7. The lower edge of the funnel 46 includes a downwardly extending flange 50 which positions the funnel over the upper end of the mold 34. By means of this funnel, it is much easier to introduce the tobacco into the mold without spilling. If desired, the plunger 26 may be inserted into the mold through funnel 46 without removing the funnel 46 from the mold.

While this invention has been shown and described in connection with particular preferred embodiments, various alterations and modifications will occur to those skilled in the art. Accordingly, the following claims are intended to define the valid scope of this invention over the prior art, and to cover all changes and modifications falling within the true spirit and valid scope of this invention.

I claim:

Apparatus for producing a cartridge of compressed pipe tobacco having a removable core piece comprising

- a mold member defining a cylindrical chamber,
- a cylindrical plunger adapted for insertion into said mold member for compression of cut pieces of tobacco within said mold member,
- each of said members having a central axial opening therein for receiving and supporting both ends of a core piece for maintaining the core piece in an axial location within said mold member while tobacco is pressed therein to thereby incorporate the core piece in the finished cartridge,
said mold member including a circumferential axially extending slot at the bottom portion of the chamber defined by said mold member to receive the edge of a sheet of moisture-resistant wrapping material to be inserted in said mold member prior to formation of the cartridge.

2. Apparatus as claimed in claim 1 wherein said mold member includes a side portion which is hingedly fastened to the remainder of the mold member and arranged to be opened after formation of the cartridge for easy removal of the cartridge.

3. Apparatus for producing a cartridge of compressed pipe tobacco having a removable core piece comprising

a mold member defining a cylindrical chamber, a cylindrical plunger adapted for insertion into said mold member for compression of cut pieces of tobacco within said mold member, at least one of said members having a central axial opening therein for receiving and supporting a core piece in an axial location within said mold member while tobacco is pressed therein to thereby incorporate the core piece in the finished cartridge, said plunger comprising a hollow tubular member having a removable cap at the upper end thereof, said plunger being arranged for the storage of fresh core pieces and moisture-proof wrappers.

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