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 [21] **649,595**
 [22] Filed **June 28, 1967**
 [45] Patented **Nov. 24, 1970**
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 [32] Priority **July 1, 1966**
 [33] **France**
 [31] **No. 67784**

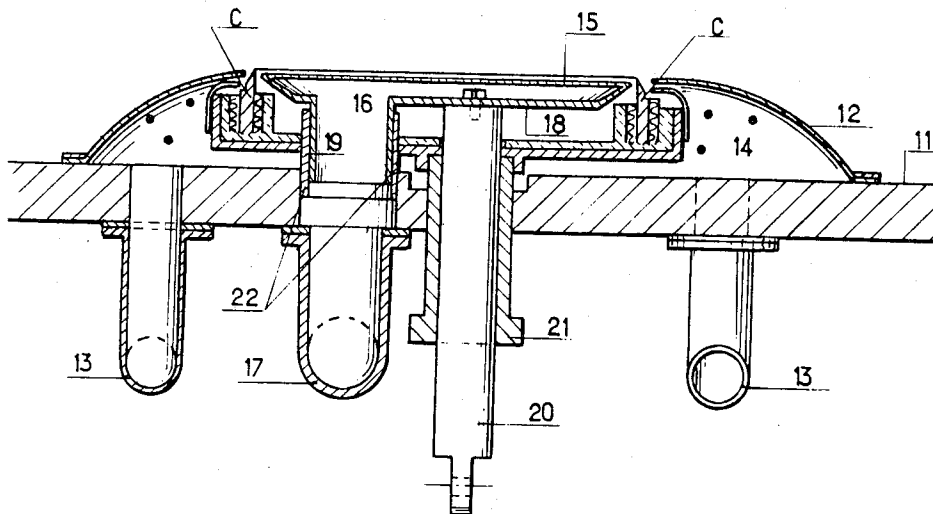
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[54] **DEVICE FOR CUTTING THE WRAPPER LEAVES OF CIGARS, CIGARILLOS OR LIKE PRODUCTS**
5 Claims, 6 Drawing Figs.

[52] U.S. Cl. **83/171,**
 131/33
 [51] Int. Cl. **A24b 7/02**
 [50] Field of Search **83/100,**
 171, 177, 510; 131/33, 34, 35, Inq

ABSTRACT: Device for cutting the wrapper leaves of cigars, cigarillos or like products, comprising means for modifying the material of the tobacco leaf along a desired cutting line, said means being adapted to produce action without any counterpart on at least one of the faces of the tobacco leaf and to cooperate with means for holding said leaf in the outspread position while producing action on at least a portion of the leaf surface which is located outside the zone of action of said leaf-modifying means.



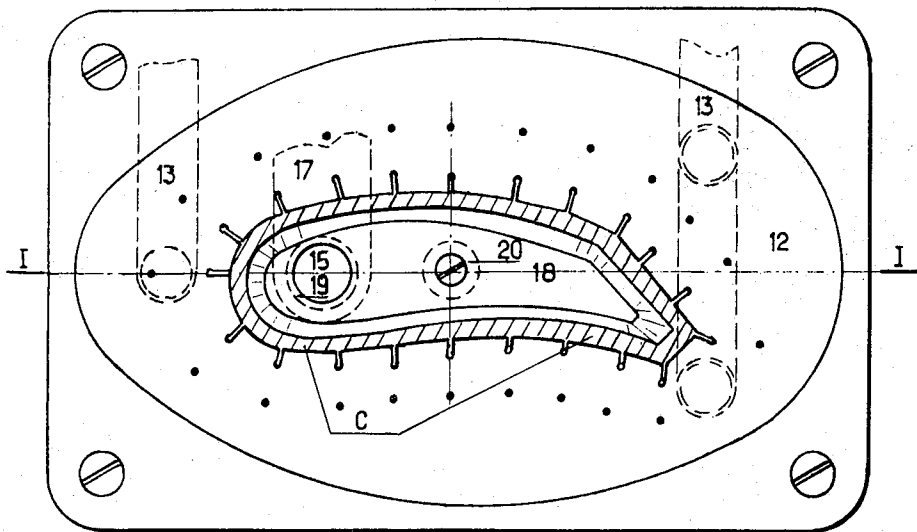
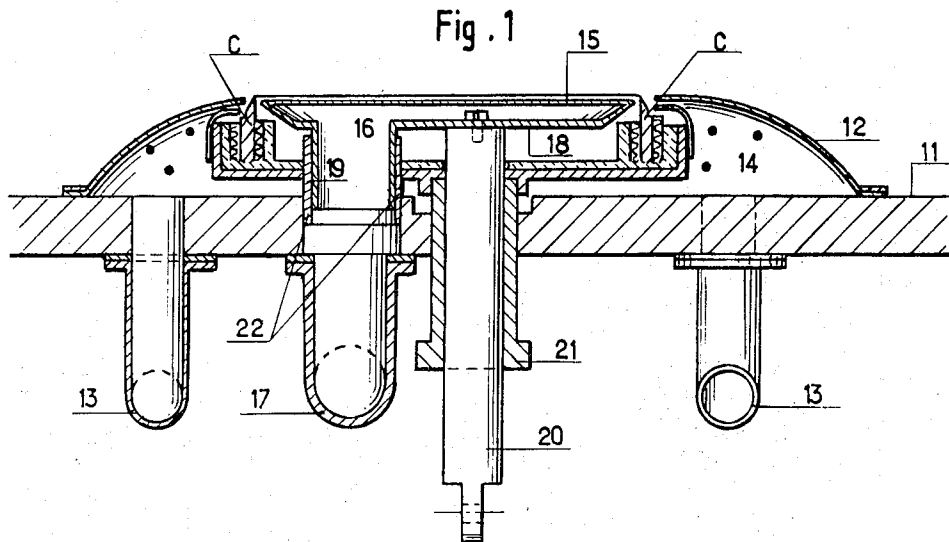
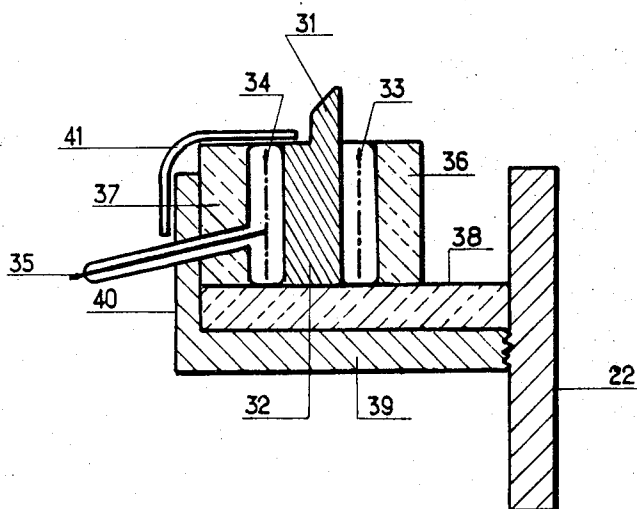


Fig. 2

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Fig. 3



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Fig. 4

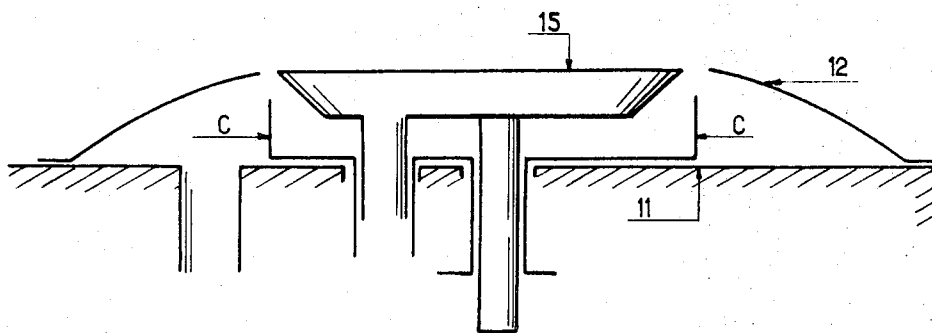


Fig. 5

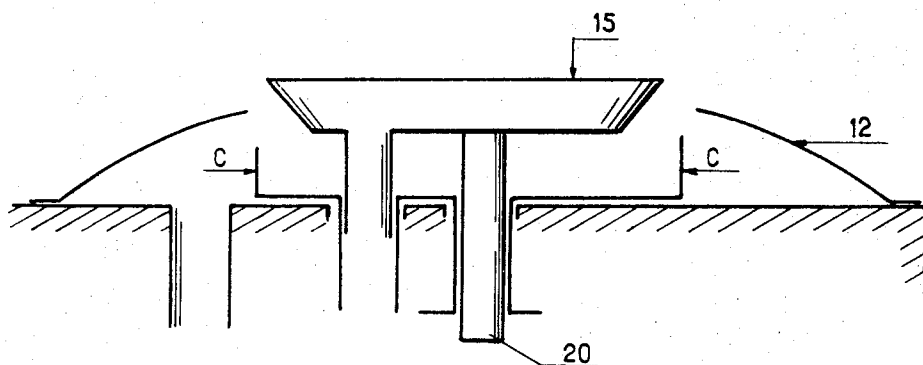
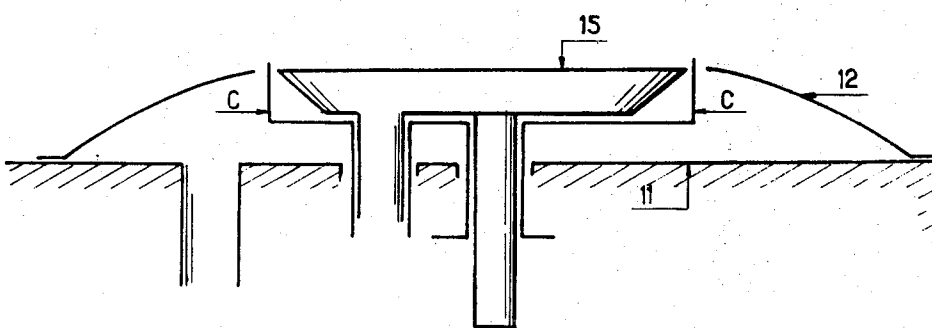


Fig. 6

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DEVICE FOR CUTTING THE WRAPPER LEAVES OF CIGARS, CIGARILLOS OR LIKE PRODUCTS

In nearly all machines for making cigars and like products, the system employed for cutting the wrapper leaves (outer leaves and sometimes binder leaves) from selected tobacco leaves is made up of the same elements, namely a perforated table provided with suction holes for the purpose of spreading out the tobacco leaf perfectly and holding it at its edge. In this table, which is slightly convex, provision is made for a central die plate which is adapted to move at right angles to its plane and also produces a sucking action, the contour of said die plate having approximately the shape of the desired wrapper. There is inserted between said movable die plate and the table a cutting frame or blade whose chamfered top edge comes level with the surface of the table. When the tobacco leaf which is laid on the table is applied in close contact therewith as a result of atmospheric pressure, the movable die plate withdraws below the normal level of the table whilst one or a number of elastic rollers sweep the free surface of the leaf. The chamfered edge of the cutting blade then shears the tobacco leaf along the desired contour. Thereupon, the movable die plate which returns in the direction opposite to that of its movement of withdrawal can transfer the wrapper which is thus formed to a conveying means which usually consists of a suction cup, the sucking action beneath said plate having meanwhile been discontinued.

The travel of the elastic rollers along the edge of the cutting blade is usually followed by the return motion of said rollers along the same path to their initial positions and takes up a substantial proportion of the cycle of operation of the machine. Even if the frequency of this cycle is partly determined by considerations other than the time taken up by the cutting operation and forming of the wrappers, any saving of time in one of the unitary stages of such operations is appreciable, if only for the reason that the machine operator is thereby permitted to perfect the manual operations which still remain necessary at the present time. The aim of this invention is therefore to shorten the wrapper-cutting stage and is attended by the following advantages: simplification of the mechanism which is necessary for this operation; suppression or spacing of regrinding operations performed on the cutting frame; enhancement of personnel safety despite the reduction of protective elements; reduction of amplitude of movement required of the machine operator; thereby permitting more careful and less tiring work even at a higher production rate.

The present invention is primarily characterized in that, in a machine of the type which either prepares or utilizes wrapping of products, the conventional mechanism which has the function of cutting out a fragment of predetermined shape from a leaf such as a tobacco leaf and which works by shearing between a cutting blade and a counterpart such as rollers is replaced by another mechanism which comprises means for modifying the tobacco leaf simply by coming into contact with the leaf along the desired cutting line, said means being adapted to produce action without any counterpart on at least one of the faces of the tobacco leaf and to cooperate with means for holding said leaf in the outspread position while producing action on at least a portion of the leaf surface which is located outside the zone of action of said leaf-modifying means.

The holding means can comprise a table which is subjected to air pressure and the shape which is determined by the cutting line is inscribed within said table.

The table can be constituted by two parts of which an inner part is inscribed within the shape determined by the cutting line whilst the leaf-modifying means are adapted to produce action between said two parts.

The leaf-modifying means are adapted to move between the two parts of the table.

The inner part of the table can be movable.

The leaf-modifying means can be constituted by an outer edge of a flat metal plate which is brought to a high temperature and can be applied against one face of the leaf.

The temperature referred to is preferably higher than 500°C.

Heat-insulated electric resistors can be applied against at least one of the faces of the flat metal plate.

Only the zone of the flat metal plate corresponding to the outer edge which is employed as leaf-modifying means is not heat insulated.

The movement of very short duration which brings the leaf-modifying means into action on the outspread tobacco leaf takes place shortly before the movement of the inner part of the table which brings the cut portion of leaf away from the level of the outspread leaf.

These movements are controlled mechanically by the programming system of the machine.

The perforations of the table are arranged so as to effect the cooling of those portions which are located in the vicinity of the heating element.

One example of execution of a device in accordance with the invention will be given in reference to the cutting of wrapper leaves (outer leaves) on a cigar-making machine. It will be understood that the invention can take many other forms, depending on the material employed and the articles being manufactured.

The example which now follows is illustrated in the accompanying drawings, in which:

FIG. 1 is a vertical sectional view of a device in accordance with the invention, this view being taken along line I-I of FIG. 2;

FIG. 2 is a plan view of the device from which the inner part 15 of the table has been removed;

FIG. 3 is a vertical sectional view of a constructional detail;

FIGS. 4, 5 and 6 are highly simplified diagrams showing the main parts of the device in the relative end positions.

There is mounted on the frame 11 of a cigar-wrapping machine the perforated casing 12 which serves to spread out and to hold the tobacco leaf in position. Suction pipes such as the pipe 13 connect the space 14 which is located between the frame 11 and the casing 12 to a vacuum source by means of flaps which have not been shown in the drawings and which are controlled by the programming system of the machine. Said system comprises, for example, a train of conventional cams. The central die plate 15 of the leaf-spreading table has an external contour which is very slightly smaller than the actual size of the wrapper to be obtained. Said die plate is also perforated and located above a space 16 which communicates through the pipe 17 with the vacuum source referred to above by means of a different flap which is controlled separately.

The space 16 is delimited by the die plate 15 and a body or mandrel 18 which has an extension in the form of a cylindrical skirt 19. The mandrel 18 is attached to the drive shaft 20 by means of screws or any suitable fastening means. Said shaft 20 is adapted to slide vertically under the control of the programming system and through the intermediary of a mechanical coupling system of known type. In FIG. 2, the die plate 15 has been removed for the sake of enhanced clarity.

The cutting mechanism proper is indicated in FIGS. 1 and 2 by the letter C and illustrated in detail in FIG. 3.

The essential component of the cutting unit is formed of special high-temperature stainless steel such as the alloy known as NSMC which is produced by the Ugine company, said component being maintained at a temperature of over 700°C. by means of a special heating system. There can be seen in this component the chamfer 31, the top edge of which follows in the plane of FIG. 2 the contour of the wrapper leaf to be cut out, and the heel 32 to which the heat produced by the heating system is directly applied. In the example shown, the heating system is constituted by electric resistors 33 and 34 which are applied against the vertical faces of the heel 32 by means of suitable clamping devices. The heating resistors 33 and 34 are supplied from a suitable voltage source through insulated wires such as the wire which is shown at 35. The complete assembly 32, 33 and 34 is heat insulated by means of asbestos cord elements 36 and 37 and by means of a base 38 which is formed of the same material and serves to separate said assembly from its support 39. Said support 39 has a verti-

cal raised edge or flange 40 against which is applied a cover 41, the function of which is to limit heat losses resulting from transfer of the air which is sucked into the space 14. In addition, said support is fixed on the tubular shaft 21 which is concentric with the drive shaft 20 of the central mandrel. The shaft 21 is adapted to slide within the frame 11 under the action of the programming system. Finally, there is secured to said support 39 a sleeve 22 which serves to guide the movement of said support within the frame 11 and, through the intermediary of the skirt 19, guides the movement of the mandrel 18 while providing a communication between the space 16 and the suction tube 17.

The relative positions of the main components are shown in FIGS. 4, 5 and 6, from which it is possible to follow the different stages of operation of a mechanism in accordance with the invention. FIG. 4 shows the mechanism at the moment when the tobacco leaf is being laid in position. The cutting unit C is in the lowermost position and its top edge is located below the plane of the die plate 15. The machine operator is therefore not exposed to any risk of burns. The leaf is applied against the casing 12 and die plate 15 as a result of suction of air through the tubes 13 and 17 and die plate 15 and is maintained thereon throughout the remaining sequence of operations.

In FIG. 5 as in FIG. 1, the cutting unit which is thrust upwards by the shaft 20 is shown to be in the operative position. The top edge of the portion 31 of unit C projects to a slight extent above the level of the die plate 15 which has remained in its initial position. A process of local and practically linear carbonization of the tobacco leaf then takes place along the contour of the cutting edge, with the result that a wrapping element of requisite size is cut out from the leaf. It should be noted that, by operating at the temperature which has been indicated earlier and, more generally, between 600 and 800°C., it is merely necessary to apply the cutting unit C against a leaf of natural tobacco for a very short time in order to separate the central portion from the remainder of the leaf. In the case of the fine leaves which are selected for cigar wrappers, the time of application can, for example, be of the order of one-tenth of a second whereas, in the conventional process which consists in shearing between rollers and a cutting blade, the time of application usually varies between 1 and 2 seconds. It is thus readily apparent that an appreciable saving of time is thus achieved by means of a mechanism which has a further advantage in that it is lighter in weight.

Should the operation be performed at higher temperatures, for example temperatures which are well in excess of 800°C., it is not necessary to ensure that the cutting unit should come into actual contact with the tobacco leaf in order to produce the requisite leaf modification. In this instance, the unit can remain a short distance below the leaf, in which case the carbonization process takes place by radiancy. By adopting this mode of operation, fouling and oxidation of the heating edge are prevented.

Immediately upon completion of the cutting operation, the

suction can be stopped within the tubes 15 while still maintaining a partial vacuum within the space 17 by means of the tube 17. The cutting unit C moves down to its initial bottom position and the shaft 20 lifts the mandrel 18 and the die plate 15 which carries the cut out wrapper up to the position shown in FIG. 6. A conveying suction cup then takes the cut wrapper which is carried by the die plate 15 in the known manner. Meanwhile, suction from the space 16 is discontinued. The mechanism is then in readiness for cutting out a fresh wrapper leaf.

It should be pointed out that the operations which consist in spreading out and then holding the leaf against the casing 12 and die plate 15 by pneumatic means make it possible to maintain these surfaces at a temperature which is wholly compatible both with safety of personnel and with conservation of the material being processed in spite of the proximity of heated components. It is also possible without thereby entailing any disadvantage to modify the perforations or holes which are formed in these surfaces as well as the suction cycle so as to ensure enhanced efficiency of the air-cooling system.

A large number of alternative forms of execution of the invention may evidently be contemplated. The example which has just been given has the advantages of being readily adaptable to existing machines, of simplifying the usual cutting systems and of reducing maintenance to a considerable extent. However, other arrangements could be found more effective in machines of novel design, especially in regard to the utilization of the cut wrappers, while remaining within the scope of this invention.

I claim:

1. A device for cutting the wrapper leaves of cigars, cigarillos, or like products, comprising a support, a perforated table mounted on said support for receiving a leaf in the outspread position, said table and said support delimiting a cavity there between, first means connecting said cavity with a source of vacuum for holding said leaf in said outspread position, second means mounted within said cavity for impairing the material of said leaf along a desired cutting line, and cutaway parts on said table, said parts corresponding to said cutting line, said impairing means producing action without any counterpart on said leaf.
2. A device according to claim 1, wherein said table is constituted by two parts, one of which being an inner part, said two parts being separated by a space corresponding to said cutting line.
3. A device according to claim 2, wherein said second means moves between said two parts of said table.
4. A device according to claim 2, wherein said inner part of the table is movable.
5. A device according to claim 4, wherein a vertically movable shaft is arranged for a movement of very short duration, said movement bringing said second means into action on said outspread leaf shortly before the movement of said inner part of said table carrying the cut portion of leaf away from the level of said outspread leaf.

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