

L. W. SPENCER.

Improvement in Machines for Manufacturing Plug-Tobacco.

No. 128,434.

Patented June 25, 1872.

Fig. 1.

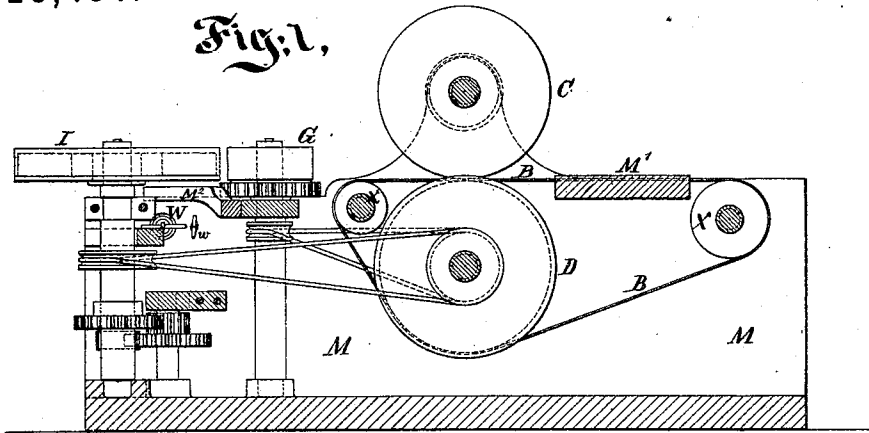


Fig. 2.

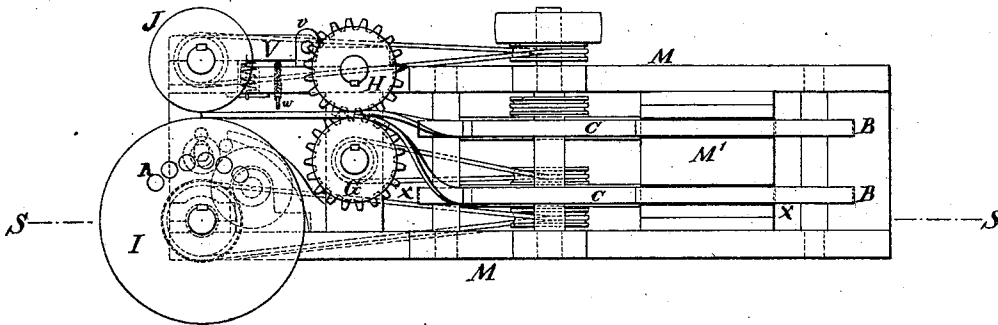


Fig. 3.

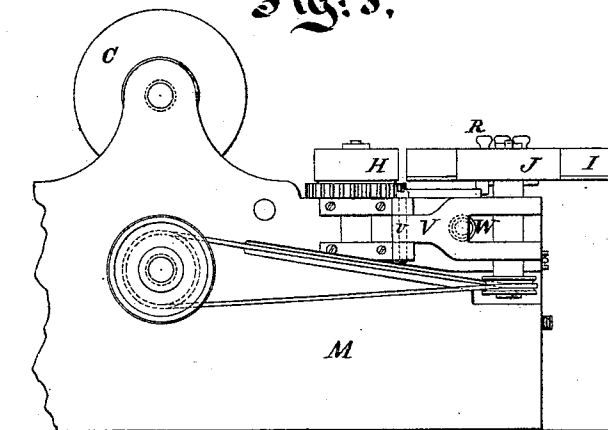
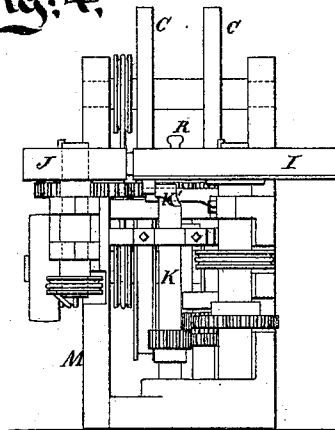


Fig. 4.



Witnesses:

Arnold Hornum
Wm C Dey

Inventor:

L W Spencer
by his attorney, E. S. Stearns

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Fig: 5.

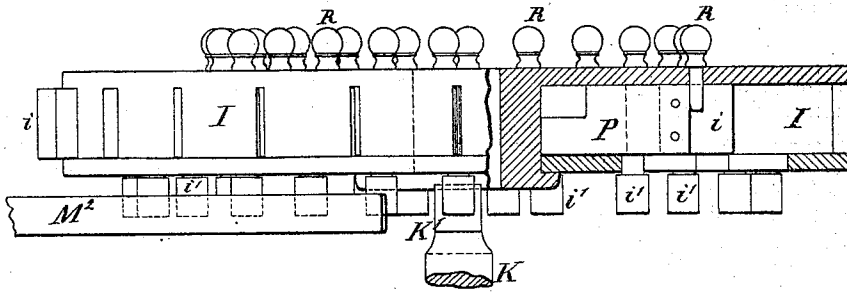
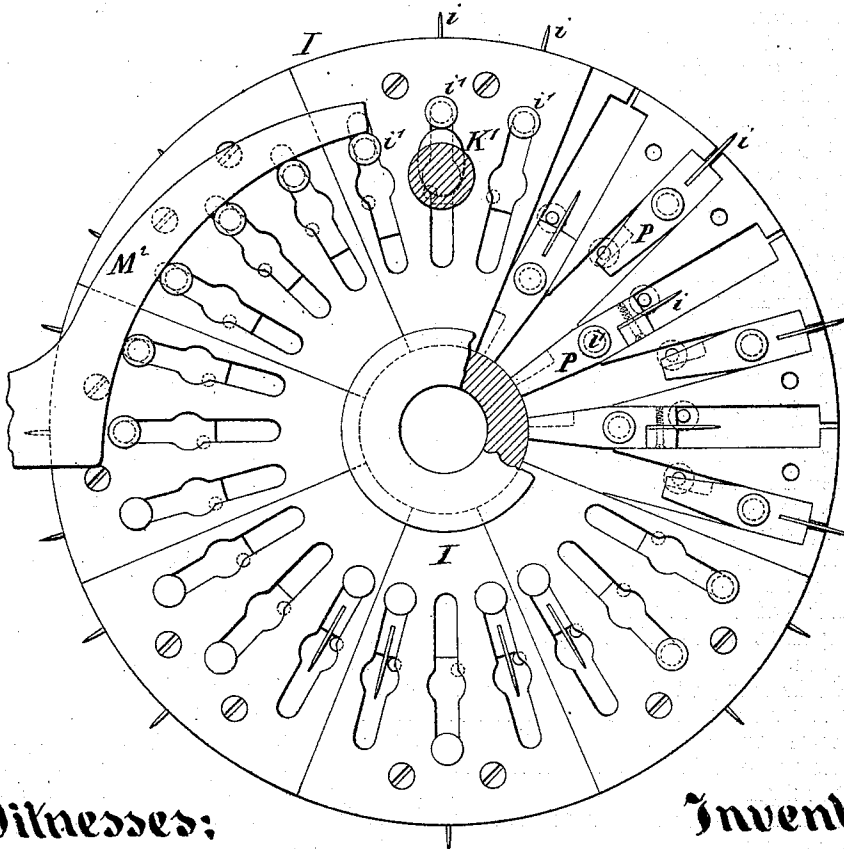


Fig: 6.



Witnesses:

Arnold Hornum.
Jm C Day

Inventor:

L. W. Spencer
by his attorney
J. L. S. S. S.

UNITED STATES PATENT OFFICE.

LEWIS W. SPENCER, OF NEW YORK, N. Y.

IMPROVEMENT IN MACHINES FOR MANUFACTURING PLUG-TOBACCO.

Specification forming part of Letters Patent No. 128,434, dated June 25, 1872.

Specification describing certain Improvements in Machines for Manufacturing Plug-Tobacco, invented by LEWIS W. SPENCER, of New York city.

The tobacco to be treated is prepared in the ordinary or any suitable manner, and is introduced into the machine by hand or through any desired number or construction of feeding devices to distribute the material evenly and smoothly in continuous lines. The machine may be adapted to receive a considerable number of these lines of material. I will describe it as receiving two. The machine not only compresses the material in the single quantities as it is received, leaving it after such compression in a condition adapted to allow a number of such continuous pieces to be subsequently compressed together, but also in the same machine, and at a single operation, applies and powerfully compresses together the several separate pieces, forming them into a firm and solid single piece. It also cuts off this compound piece into proper lengths to form plugs of tobacco.

The following is a description of what I consider the best means of carrying out the invention. The accompanying drawing forms a part of this specification.

Fig. 1 is a longitudinal vertical section on line *s s* in Fig. 2. Fig. 2 is a plan view. Fig. 3 is a side elevation of a portion on a larger scale. It is a view from what is the back side in Fig. 1. Fig. 4 is an end view.

The additional figures represent certain details on a much larger scale. They represent the peculiarities of the circular and connection which operate to cut off the tobacco in suitable lengths.

Fig. 5 is a side view, partly in section, and Fig. 6 is a view from below with a portion of the shell removed to show its interior.

Similar letters of reference indicate like parts in all the figures.

M is the fixed frame-work or support for the several working parts, and *M*¹ is a table or portion thereof, which aids to support the endless bands *B*, on which the material is run into the compressing-rollers *C* and *D*. The bands *B* are carried on rollers *x x*, which, as also the strong compressing-rollers *C* and *D*, are turned by suitable gearing connected to a steam-engine or other power not represented, so as to

carry the bands *B* and any material applied thereon continuously through the bite of the compressing-rolls. These latter rolls *C* and *D* compress the material into thin, flat, continuous pieces. The lower rolls *D* are channeled, and the upper rolls *C* are of a proper width to just match into the channels.

The tobacco thus once compressed adheres somewhat to the band *B*, on which it has been compressed. After the operation is started, and the tobacco commences to be delivered continuously, the delivered portion is lifted up from the band *B* and is introduced between a second powerful set of compressing-rolls, which are mounted on upright shafts and marked *G H*. These are driven by suitable connections so as to turn with just the proper speed, and they compress the two continuous flat pieces of tobacco which are received from the two bands *B B* and deliver them in a single continuous piece; the conditions under which they are applied and compressed together being such that they adhere quite firmly together and form a unit.

It will be understood that in practice there may be four, six, or any other desired number of bands *B B* instead of the two here represented, and that there may be a corresponding number of the continuous pieces of tobacco to be applied together. It is well to apply a maximum number in constructing the machine—as, for example, six—and to afterward use only five, four, or such other number thereof as is found expedient in the working of any particular make of goods or working any particular quality or character of material.

The tobacco delivered from the rolls *G H* passes along horizontally a little distance and is then subjected to the action of cutting-knives to divide it into suitable lengths to form the finished plug-tobacco ready for the market. The knives are marked *i*, and are mounted so as to be free to move radially a little distance in a rotating shell or carrier, *I*. The cutters *i* work in slots in the periphery of the shell *I*, and are driven out and withdrawn rapidly at a certain stage in their movement. The position where the action of each cutter is made available is in passing a roller, *J*. This roller *J* supports the tobacco while a cutter, *i*, is driven out rapidly through the tobacco. The movement of the cutters radially out-

ward in the shell or carrier I is effected by means of the cam K', which is mounted on the revolving shaft K, and acts on a projecting pin or roller, *i'*, which projects downward through a radial slot in the carrier I. It will be understood that there is one of these radial slots and one of the rollers *i'* for each of the cutters *i*, and that as each cutter passes the point where its action is required it is driven outward rapidly by the action of the cam K'. The cutters *i* are drawn inward again at a proper period by means of the fixed piece M², which has an arm fixed on the framing M, and adapted to act gradually on each roller *i'* as it passes; the acting surface being gently spiral draws each cutter *i* in gradually, but it is important that in the active outward movement of each cutter it move rapidly, so as to cut off the tobacco squarely or very nearly so. In order to cut the tobacco off in plugs of different lengths, I have provided means for throwing one-half or any other proportion of the cutters *i* out of use. The means for effecting this are simple, and can be operated with little skill. Mounting the cutters *i* sufficiently close together to cut the shortest lengths of tobacco, which are ever required—say, for example, three inches—I can make the plugs six inches by throwing the alternate knives out of use. Each knife *i* is mounted in a solid piece, P, which fits loosely in a radial space or slot provided in the carrier I, in which piece P the cutter *i* may be fitted by screws or analogous means, adjustable in any ordinary or suitable manner. This allows the cutters to be removed and ground or exchanged, when required.

The especial provisions which I have referred to for throwing them out of use are simple, and operate by moving the entire block P with its attached cutter *i* radially inward so as to be out of contact with the cam K'. To effect this it is necessary simply to pull out the corresponding pin R, which is inserted through a hole in the upper face of the shell I, and which, when the block P is in position for use, stands behind or inside of the block and allows the proper movement of the block P and its attached cutter *i* in the space exterior or further from the center of the shell I. Now, when it is desired to throw that block P and its attached cutters out of use, it is necessary simply to remove the pin R and push the block P and its connections radially inward, a movement which is allowed by giving a proper length to the slot in the lower face of the shell I, and again inserting the pin R. In this new condition of the apparatus the pin R stands outside of or further from the center of the shell I than the block P and holds it locked idly in its new position. It remains idle so long as desired, and is always ready to be thrown into use at a moment's notice by simply pulling the pin R, moving the block radially outward, and again inserting the pin R.

The function of the roller J is simply to form an abutment, against which the tobacco is held in the cutting operation. It is important that

it shall yield a little under some circumstances. I propose to make the exterior surface of vulcanized India rubber or some other yielding material which will allow the knives to cut quite up to it, and thus to sever the tobacco completely without injuring the knives. I propose to try wood of various qualities, mounted so as to present the end of the grain outward. It may be well to slightly notch or groove the surface of the material, whatever it may be, to allow each knife to sink a little within the periphery.

With either construction of the roller it is important to allow it to yield a little in extreme cases. I provide for this by mounting the entire roller J in a swinging frame, V, turning on a center, *v*. It may be held to its work by a strong spring, W, and its position may be gauged by a gauge-screw, *w*.

The tobacco may be supported between the bands B and the doubling or second compressing rollers G H by a fixed cross-piece or short table, not represented, and similar means may be adopted to support the tobacco between the rolls G H and the cutting devices I i J.

Although my machine is eminently adapted to treat the tobacco completely, giving it all the compression necessary in its transfer from the condition of loose and properly-dampened and adhesive leaves to the complete plug, it will be readily seen that the material may be previously treated to a partial compression. In such case the material will be introduced upon the bands B in the condition of partly compressed and flattened continuous pieces.

Although I have described what I consider the best form of the several details there may be various modifications without entirely defeating the purposes of the invention. Thus, for example, the cam K' instead of continuously revolving may rock or oscillate, or even may with some success be a fixed piece, located as shown, and acting rapidly on the pressing-block P. So also the secondary rollers G H instead of being mounted with their axes at right angles to the plane in which the tobacco is compressed by the primary compressing-rolls C D may stand at various other angles so long as the end is accomplished of properly drawing together and uniting in one the imperfectly flexible and partially plastic material.

I claim as my invention—

1. The combination, in a single machine, of the primary compressing-rolls C D and the secondary compressing-rolls G H, arranged to serve relatively to each other and to the continuous pieces of material treated, as herein specified.

2. The revolving shell I carrying movable blocks P with cutters *i* guided in slots in the end or head of the shell so as to allow their being moved outward through the tobacco by any suitable agency, and being firmly guided in such motion, as herein specified.

3. The cam K', arranged and serving relatively to the cutters *i* and parts *i'*, so as to throw out the cutters with a rapid movement, in com-

bination with means for delivering the material to be acted on without stopping, all as herein specified.

4. The combination and arrangement of the rolls C D and bands B, the secondary rolls G H, shell I, cutters *i*, abutting-roll or surface J, and operating parts *i'* K', as herein set forth.

5. The adjustment of a portion of the cutters *i* inward so as to be thrown out of use to produce various lengths of tobacco, in combi-

nation with suitable means for compressing and presenting the tobacco, as herein specified.

In testimony whereof I have hereunto set my hand this 15th day of April, 1872, in the presence of two subscribing witnesses.

LEWIS W. SPENCER.

Witnesses:

ARNOLD HÖRMANN,
THOMAS D. STETSON.