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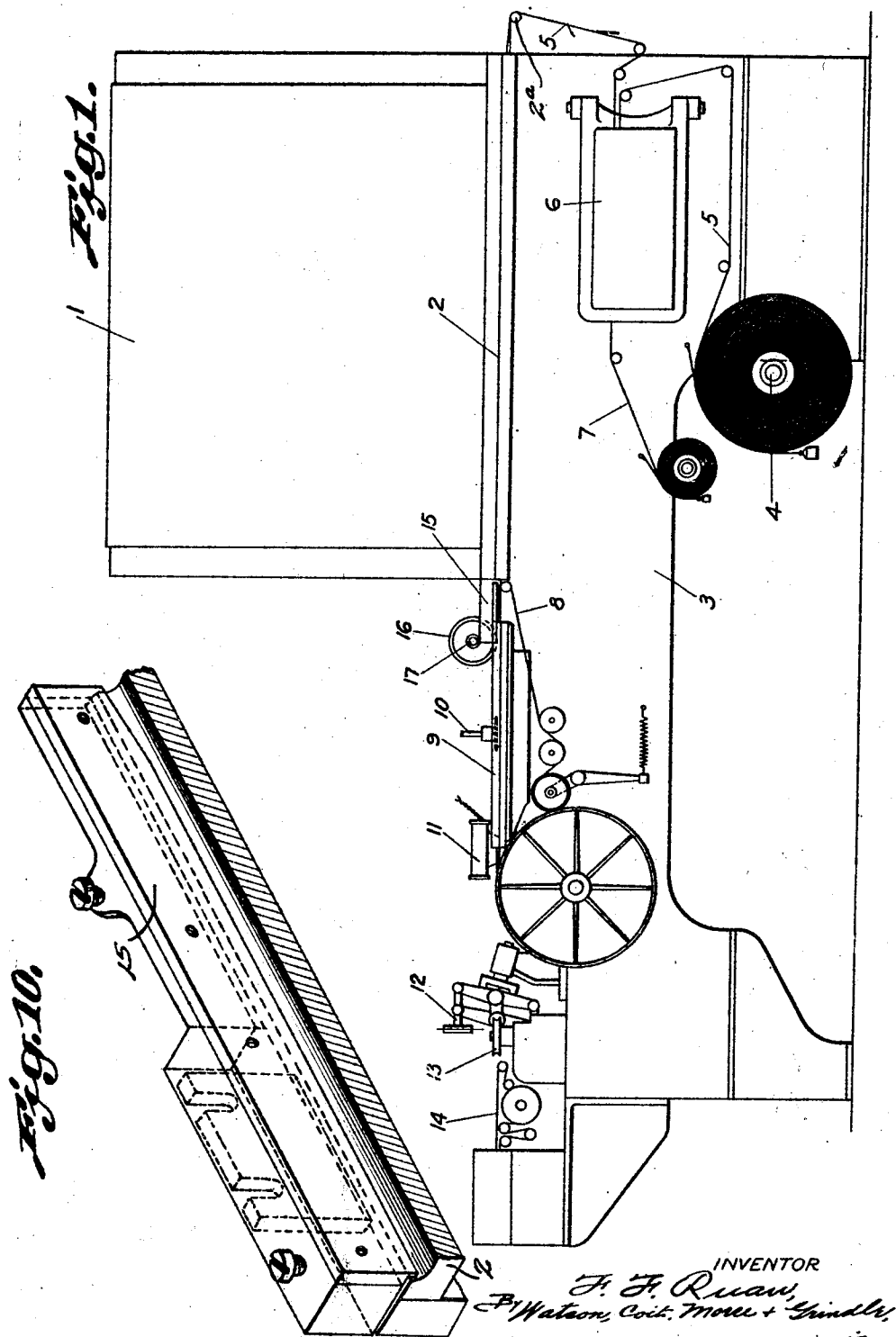
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CIGARETTE MAKING MACHINERY

Filed May 29, 1926

3 Sheets-Sheet 1



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3 Sheets-Sheet 3

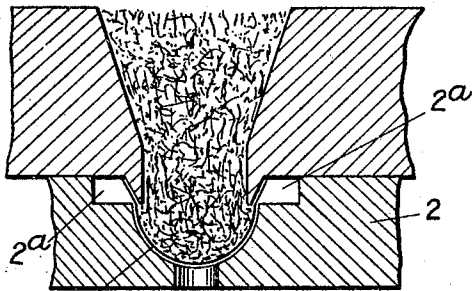


FIG. 4.

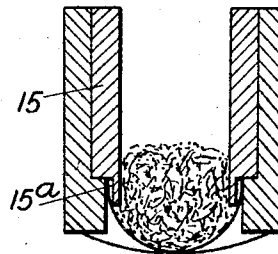


FIG. 5.

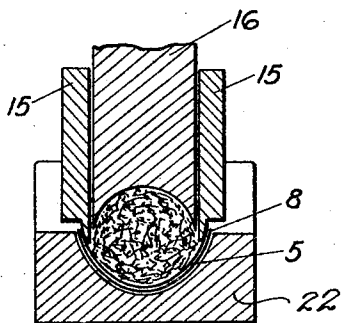


FIG. 6.

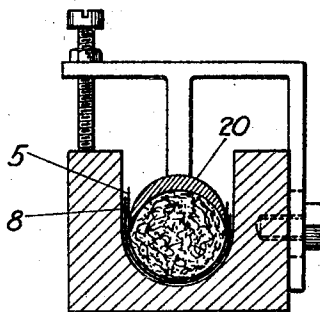


FIG. 7.

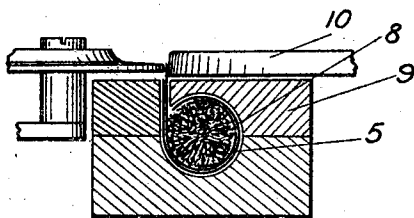


FIG. 8.

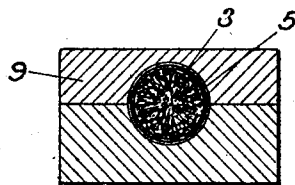


FIG. 9.

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CIGARETTE-MAKING MACHINERY

Application filed May 29, 1926, Serial No. 112,556, and in Great Britain June 2, 1925.

This invention is for improvements in or relating to cigarette making machinery, and more particularly to cigarette making machinery of the continuous rod type, in which tobacco is fed continuously from a hopper on to a travelling web of cigarette paper drawn continuously beneath the delivery end of the hopper.

It is an object of the present invention to provide means in a cigarette making machine of the above character whereby the tobacco rests solely against the travelling web of the cigarette paper as it is moved forwardly through the trough of the machine, and is thereafter subjected to a uniform compression between two, or more, moving elements to convert it into a uniform rod.

The present invention consists of a cigarette making machine of the continuous rod type wherein tobacco is continuously fed from a hopper on to a U or equivalently shaped web of cigarette paper continuously drawn through a trough located beneath the delivery end of the hopper and means comprising a plurality of moving elements, adapted to receive the loaded web and subject the tobacco to a uniform radial pressure.

Further the present invention consists of a cigarette making machine of the continuous rod type which comprises a hopper adapted automatically to feed tobacco to a U or equivalently shaped trough located beneath the delivery end thereof, means operatively connected to, or formed integral with said trough adapted to control a web of cigarette paper in its passage through the same so that the web bears upon the surface of the trough and conforms to the configuration of the same, an endless tape located in advance of said trough and movable in the direction of the axis of the same through a U or equivalently shaped guide and a compression wheel, having a circumferential semi-circular groove formed in the rim thereof, mounted above the U or equivalently formed portion of the tape so as to be rotatable in the same direction as the tape moves.

The invention is more particularly described with reference to the accompanying drawings in which:—

Fig. 1 is a side elevation of a cigarette making machine of the continuous rod type.

Fig. 2 is a detailed elevation of a section of the cigarette making machine illustrated in Fig. 1.

Fig. 3 is a plan view of Fig. 2.

Figs. 4, 5, 6, 7, 8 and 9, are sections on the lines *a-a*, *b-b*, *c-c*, *d-d*, *e-e*, and *f-f*, of Fig. 2 and illustrate diagrammatically how the continuous rod is gradually formed upon the machine illustrated in Fig. 1.

Figure 10 is a perspective view illustrating means for adjusting the paper in its movement through the trough, parts being broken away for the sake of clearness; and

Figure 11 is a section taken on the line 11—11 of Figure 10.

Referring to the drawings, 1 is a hopper preferably constructed according to my United States patent application No. 56,355, and adapted automatically to deliver continuously tobacco to a trough 2 of U-shaped cross-section, located beneath the delivery end thereof. Mounted upon the bed 3 of the cigarette machine is a reel 4 containing a continuous web 5 of cigarette paper. The cigarette paper is adapted to extend through a printing mechanism 6 from which it is fed over the roller 2*b* and through the trough 2 of the machine, with the edges of the web extending into the recesses 2*a*. The tension of the tape caused by the roller 2*b* and the weight of the tobacco together with the engagement of the edges of the paper with the walls of the recess 2*a* cause the web to conform to the configuration of the U groove of the trough 2 and bear upon the surface of the same. If necessary, mechanism may be provided for periodically applying cork or like tips from the cork web 7 to the web of cigarette paper. The mechanism for applying the tips is preferably combined with the printing mechanism 6 and is preferably constructed according to British patent application No. 31,371 of 1924. It forms no part of the present invention.

The web of the cigarette as it passes from the U shaped trough 2 engages with a continuously moving tape 8 and is carried forwardly by the same as it is moved through

folding mechanism 9, gumming mechanism 10, and the heating element 11. The cigarette rod so formed is thereafter passed through a cutting mechanism 12 which periodically engages with a ledger plate 13 and severs the rod into cigarettes. The cigarettes so formed are thereafter carried forward by a belt 14 which separates each successive cigarette from its neighbour, whereupon every alternate cigarette is delivered to a different portion of a belt (not shown) travelling at right angles to the direction of the axis of the moving rod.

The endless tape 8, at the point where it receives the loaded web of cigarette paper, engages with a continuation of the guide members 15 which in conjunction with the trough 22 (Fig. 6) are adapted to turn the edges of the tape upwardly so as to force the same to conform to a U or equivalent shape. Mounted above the U or equivalently shaped portion of the tape 8, is a compression wheel 16 having a circumferential groove of semi-circular cross section formed in its rim. The wheel 16 is adapted to be rotated about a spindle 17 in the direction of the axis of the moving rod. Mounted on the spindle 17 of the compression wheel 16 is an arm 18 which carries a wedge shaped scraper 19 adapted to engage with the semi-circular groove in the wheel 16 and constitute a tangential continuation of the said groove in the direction of the axis of the moving rod. The wedge shaped scraper 19 is adapted to engage with the forward end of a compression throat 20 which in turn is arranged to form a continuation of a folding mechanism 21.

The operation of the machine is as follows:—Tobacco is fed continuously from the hopper 1 on to the web of cigarette paper 5. Due to the web 5 being restrained to a U configuration the major portion of the tobacco fed from the hopper rests against the cigarette paper and is, in consequence, moved forwardly without engaging with any stationary guide members which tend to impede the movement of the tobacco and cause loose and dense portions to be formed in the rod.

As the loaded web of cigarette paper leaves the trough 2 it is received by the tape 8 and the edges of the web are adapted to engage with recessed portions 15a formed in the guide members 15. The guide members 15 are preferably mounted so as to be adjustable in a vertical direction and thereby enable one edge of the cigarette paper to be moved relatively to the other. One method of adjusting the guide members 15 to effect the movement of the paper is illustrated in Figs. 10 and 11. It will be noted that the guides 15, of which only one is shown, are clamped to the frame by plates 23 to which the guides

are adjustably secured by bolts 24 or some equivalent means. Set screws 25 are threaded through blocks 22, integral with or secured to the guides 15, these set screws engaging the frame of the machine at their lower ends. It will be apparent that by loosening the bolts 24 and adjusting the set screws 25 the guides 15 may be raised or lowered, and the necessary adjustment of the paper within the trough may be readily effected.

The web 5 of cigarette paper is carried, by the U shaped portion of the tape 8 in the manner illustrated in Fig. 6, beneath the compression wheel 16 which compresses the tobacco between the moving tape 8 and the compression wheel 16 in the manner illustrated in Fig. 6. Due to the configuration of the tape 8 and the semi-circular groove in the wheel 16 the tobacco is subjected to a substantially constant radial pressure between two moving elements, thus eliminating any possibility of sections of the tobacco slipping relatively to one another as is liable where the tobacco is compressed between a fixed and moving element. The compressed tobacco is thereafter moved beneath the scraper 19 into the adjustable throat 20 Fig. 7 where it is subjected to a gradual compression and converted into a continuous rod of tobacco. The rod together with the web of cigarette paper is thereafter passed through folding mechanism which folds over one side of the cigarette paper and presents the other edge to the gumming mechanism 10. After the overlap has been gummed, the same is passed through folding mechanism which wraps the gummed edge downwardly, and the overlap is thereafter dried by the heater 11 and the rod formed is severed into cigarettes in the manner hereinbefore described. Thus it will be seen that according to the present invention the tobacco fed from a hopper 1 rests upon the web of the cigarette paper and does not engage with any stationary guide members which are liable to retard its motion and cause the density of the tobacco to vary at different parts of the web. Further the tobacco located in the U portion of the cigarette paper is compressed between a grooved compression wheel and a travelling tape which is forced to conform to a U configuration thereby ensuring that the rod is subjected to compression between two moving parts and not between a moving part and a stationary member. The tobacco so pressed is passed into a taper throat without releasing the compression upon the same, when it is still further compressed before it is finally passed into a folding and gumming mechanism which completes the rod. Thus it will be seen that according to this invention the tobacco deposited upon the web of cigarette paper from the hopper is never subjected to any action which is liable to vary its density at any point along the rod.

What I claim is:—

1. In a cigarette making machine of the continuous rod type, in combination, a filling trough of U cross section, a rod forming mechanism, an endless tape movable through the rod forming mechanism only and adapted to feed a continuous strip of cigarette paper through the filling trough and the rod forming mechanism, and a compression wheel disposed between the filling trough and the rod forming mechanism and mounted above the said tape so as to be rotatable in the direction of the cigarette rod, said rod forming mechanism including a scraper engaging the compression wheel, disposed tangentially thereto and extending in the direction of the axis of the moving rod, and an adjustable compression throat in the rear of and engaging said scraper.

2. In a cigarette making machine of the continuous rod type, in combination, a filling trough of U cross section, means for continuously supplying tobacco to said trough, a rod forming mechanism, an endless tape movable through the rod forming mechanism and adapted to feed a continuous strip of cigarette paper through said trough, guide members disposed between the tobacco and the tape each recessed to receive one edge of the cigarette paper and movable to vary the position of one edge relatively to the other, and a compression wheel disposed between the said guide members and the rod forming mechanism and mounted above said tape so as to bear upon the tobacco carried by the cigarette paper into the rod forming mechanism.

3. In a cigarette making machine of the continuous rod type, in combination, a filling trough of U cross section, means for continuously supplying tobacco to said trough, a rod forming mechanism having a compression throat, an endless tape movable through the rod forming mechanism and adapted to feed a continuous strip of cigarette paper through said trough, a pair of guide members disposed between the tobacco and the tape each recessed to receive one edge of the web of cigarette paper and movable to vary the position of one edge relatively to the other, and a compression wheel mounted above said tape and at the mouth of the compression throat of the rod forming mechanism so that the tobacco conveyed by the cigarette paper is subjected by the compression wheel and the throat to a continuously gradually increasing compression.

4. In a cigarette making machine of the continuous rod type, in combination, a filling trough of U cross-section, a rod forming mechanism, an endless tape movable through the rod forming mechanism only and adapted to feed a continuous strip of cigarette paper through the filling trough and the rod forming mechanism, and a compression

wheel disposed between the filling trough and the rod forming mechanism and mounted above the said tape so as to be rotatable in the direction of the cigarette rod.

In testimony whereof I hereunto affix my signature.

FÉLIX FRÉDÉRIC RUAU.

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